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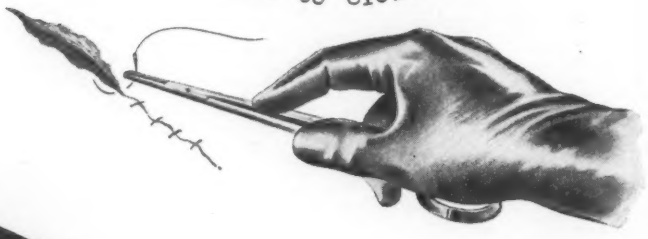

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MILITARY MEDICINE

ORIGINAL ARTICLES

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Neurological Corollaries of Neo-Natal Death Following X-Radiation of the Mouse Fetus on Gestation Day 13.5*

By

ROBERTS RUGH AND JOAN WOLFF

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THE fully differentiated neurone is highly resistant to radiation damage but the differentiating neuroblast is probably as radiosensitive as any cell (Rugh '49, Hicks '50, '53). Most of the organ systems of the 13.5 day fetal mouse have been layed down but there exist, throughout fetal life, neuroblasts which are differentiating into neurones associated with these various organ systems. The most concentrated region to study the response to x-radiation of nervous elements is in the central system, the brain and spinal cord. A dose of 300 r to the 13.5 day old fetus will allow it to be delivered 6 or 7 days later but it will be so sickly that, in most cases, it will be destroyed by the mother. Since a dose of 250 r can be tolerated and the delivered mice will survive for weeks, the chosen dose of 300 r may be regarded as the minimum lethal dose. The initial damage to this primary nervous system of the fetus and the futile attempt, during subsequent days, to repair the damage completely is described in this paper.

MATERIALS AND METHOD

Mature CF_1 female mice of known fertility were time-mated with males of the same strain and 13.5 days later they were exposed to whole body radiation equivalent to an air dose of 300 r measured to the level of the gravid uterus. Some of these pregnant and x-radiated mice were sacrificed at 4, and others at 24 and 72 hours following exposure and the lowermost fetuses were sectioned at 10 μ transversely, mounted serially and stained with Delafield's haematoxylin without benefit of counter stain. Parallel controls (unirradiated) were similarly prepared.

The radiation facilities consisted of a Quadrocondex constant potential therapy x-ray machine set at 50 cm. distance from target to the level of the gravid uterus, and with rays hardened by added filtration of 0.28 Cu and 0.50 Al filters. The output of the machine under these conditions and to the level of the uterus was 96.6 r/min.

OBSERVATIONS

The brain. The brain of the 13.5 day fetal mouse has achieved its primary organogeny, and the five divisions can be distinguished. There is, however, continuous growth and differentiation principally out from the lining ependymal cells lining the primary cavities. The growth direction is outward from the ependyma so that the more peripheral the region studied the more advanced in development (differentiation) will

* Based on work performed under Contract AT-30-1-GEN-70 for the Atomic Energy Commission.

it be. Such cortical cells as exist at this time are considered to be rather radioresistant, while the mantle zone, being made up of differentiated and differentiating nerve elements, will respond to radiation insult by showing some degree of pycnosis and karyorrhexis. However, it is the inner nuclear layer just peripheral to the closely-packed ependyma that suffers to the greatest extent following x-radiation.

The above general description holds true for most of the brain but there are a few regions of the differentiating ependymal zone which are themselves so radiosensitive as to be destroyed by 300 r x-rays. This may well be related to active nerve tract development. This can be seen in the telencephalon, the mesencephalon, and the myelencephalon. Conversely, there are simultaneously regions of the diencephalon (Figs. 6, 15, 27) and parts of the lateral ventricles (posterior horns) (Fig. 21) where the ependyma and adnexa seem to be undamaged. We cannot, therefore, draw a simple picture of radiosensitive areas with respect to the primary organization of the fetal brain. It should be possible to use the topographical distribution of damaged areas of the brain following irradiation at specific times, in order to plot out the areas of active differentiation.

The telencephalic portion of the forebrain appears to be the most severely damaged (Figs. 1, 2), probably because it has achieved the least cortical differentiation at the time of exposure. Almost the entire thickness of the presumptive cerebrum is destroyed by 4 hours after exposure. At 24 hours (Figs. 11-13) the vesicles are still filled with dead cells and debris but there is some evidence of

PLATE I. SECTIONS OF MOUSE BRAIN 4 HOURS FOLLOWING EXPOSURE OF FETUS TO 300 R X-RAYS AT 13.5 DAYS GESTATION

FIG. 1. Anterior horn of lateral telencephalon showing almost complete desquamation of neuroblasts into the ventricle.

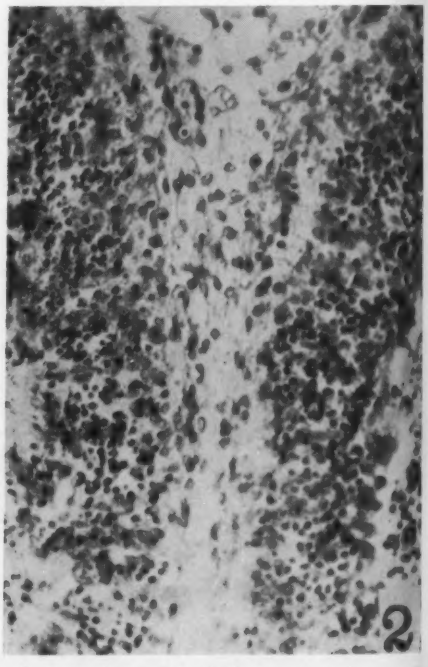


FIG. 2. Column of fornix between anterior ventricles showing mixture of neuroblasts in pycnosis among apparently normal (unaffected) oligodendroglia and differentiated neurones.

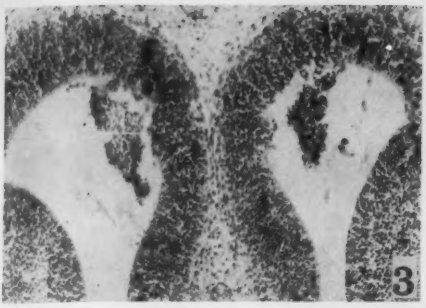


FIG. 3. More dorsal aspects of the telencephalon showing widespread pycnosis but less desquamation of neuroblasts into the ventricle suggesting that some differentiation into cerebral neurones at this level may have taken place.

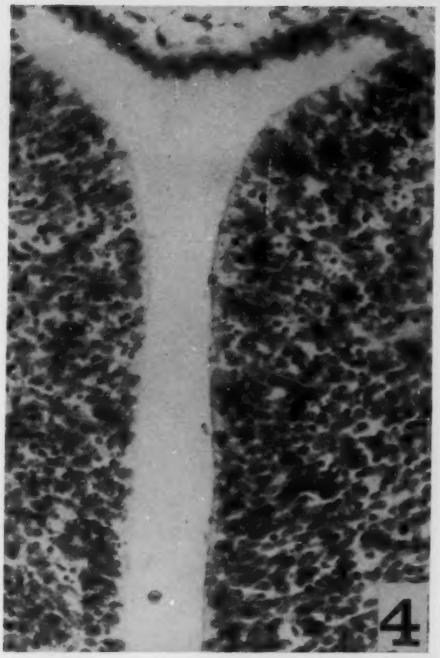


FIG. 4. Foramen of Monro and third ventricle. Note mixture of pycnotic nuclei and apparently normal cells uniformly mixed lateral to the ventricle. Some ependyma affected.

FIG. 5. Posterior horn of lateral ventricle, with widespread pycnosis among otherwise normal appearing cells. No desquamation.

FIG. 6. Level of thalami of the diencephalon showing some pycnosis. Anlage of the anterior pituitary gland largely unaffected.

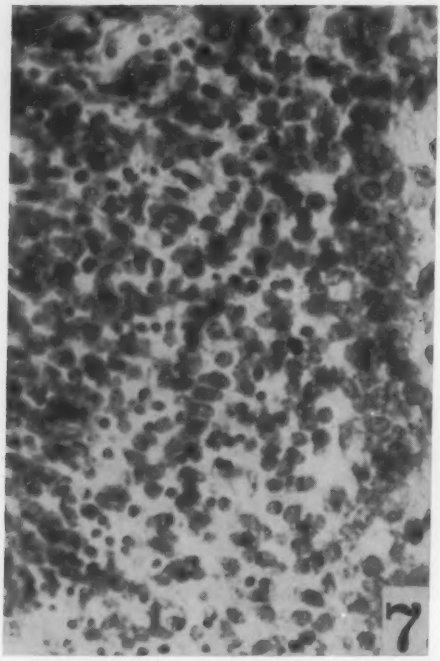


FIG. 7. Region of the thalami enlarged (from Fig. 6) to show a mixture of pycnotic neuroblasts and some dead cells among some normal appearing differentiated cells, neurones and glia cells.

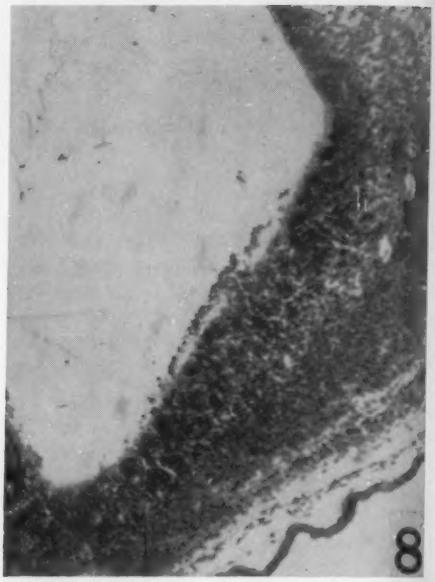
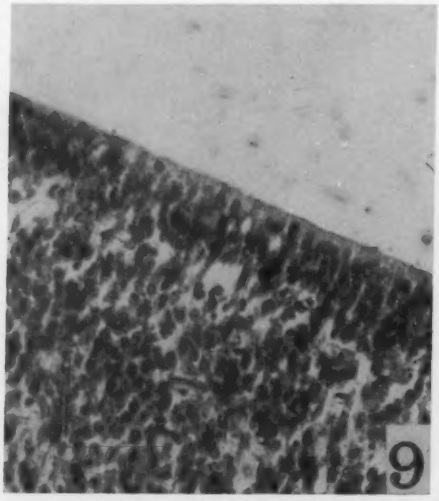
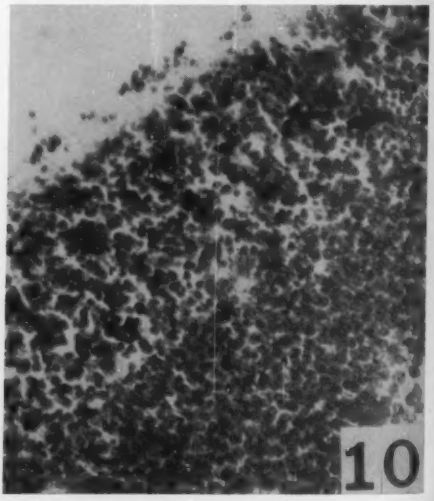


FIG. 8. Thick-roofed mesencephalon showing desquamation of neuroblasts from the dorso-lateral walls from which the colliculi develop, indicating their differentiation at the time of irradiation. The ventro-lateral walls (tegmentum) appear to be undamaged.





FIGS. 9, 10. Portions of the mesencephalic ventro-lateral (9) and dorsolateral (10) walls enlarged to show detail.

attempted differentiation in the form of rosettes. Some of the lining ependyma appears rather intact. By 72 hours (Figs. 23-26) the only evidence of differentiation is the further development of rosettes, while there is no evidence whatever of norr 1 cortex formation. That some normal mitoses are seen (Fig. 26) as not surprising for these, no doubt, occur in cells that had gone beyond the neuroblast stage and were attempting to continue normal development at the time of x-radiation. Lacking in the normal tensions of associated cells they form clusters which result in rosettes.

That portion of the floor of the diencephalon closely associated with the development of the pituitary gland (Fig. 6) shows only a very few and scattered pycnotic nuclei and there is no evidence of any interruption of development. This is also true of parts of the third ventricle (Figs. 15, 27) but not of the more posterior region (Fig. 28) which is rather extensively damaged. The body of the developing thalami appear to be an equal mixture of dead and living cells and nuclei (Figs. 6, 7).

More posteriorly the mesencephalon is clearly divided into the dorsolateral walls from which the colliculi develop and which are apparently actively differentiating in the 13.5 day fetus because this entire wall is desquamated (Fig. 8, 10). More peripherally there is quite normal cortex. The ventrolateral walls appear to be intact (Figs. 8, 9) and therefore are considered to be radioresistant. The fact that this portion

PLATE II. SECTIONS OF MOUSE BRAIN 24 HOURS FOLLOWING EXPOSURE TO 300 R X-RAYS AT 13.5 DAYS GESTATION

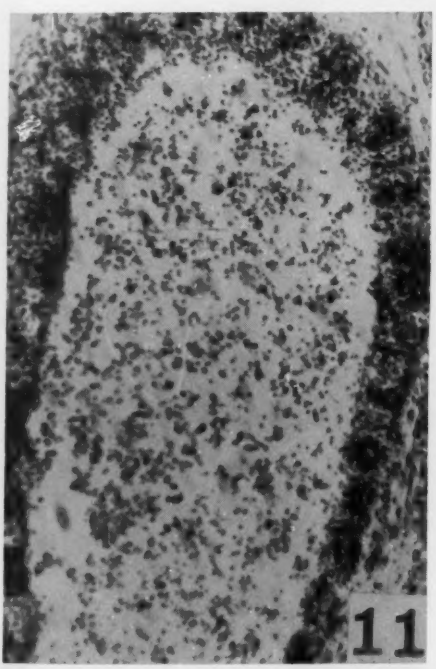


FIG. 11. Anterior horn of lateral telencephalon showing loose cells and pycnotic nuclei within the ventricle, and the beginning of rosette formation by some of the neurectoderm of the telencephalic (cerebral) wall.

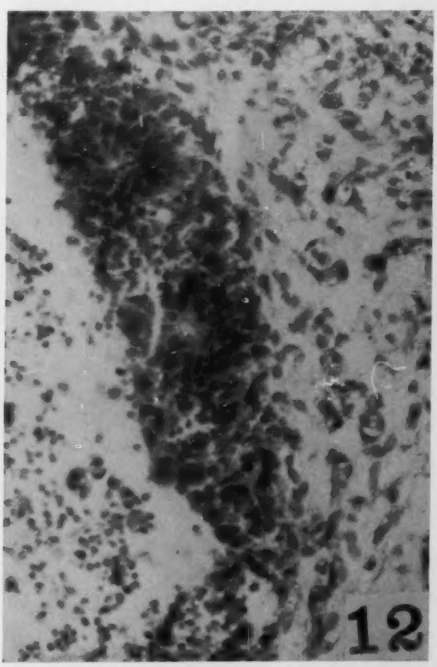


FIG. 12. Enlarged section from Fig. 11. Note disorganization in wall of lateral ventricle and rosette formation.

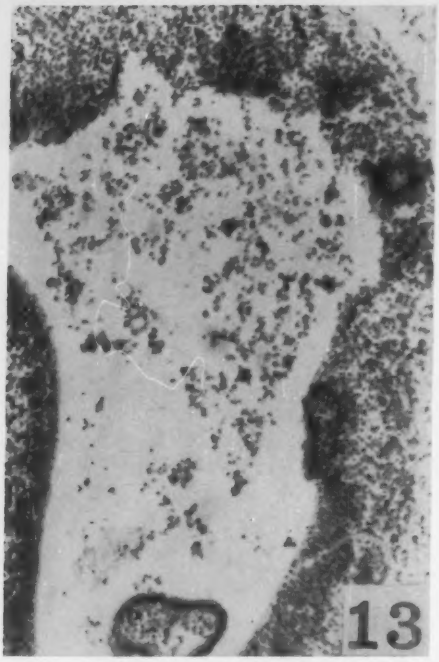


FIG. 13. More mesial aspect of lateral ventricle. Severe damage.

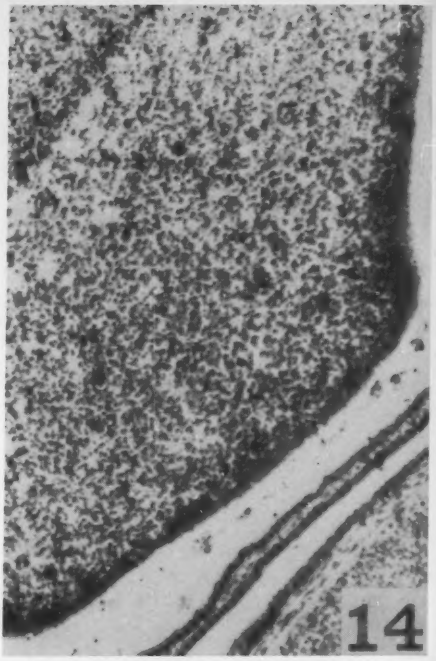


FIG. 14. Level of caudate nucleus showing less desquamation and abundant pycnosis.

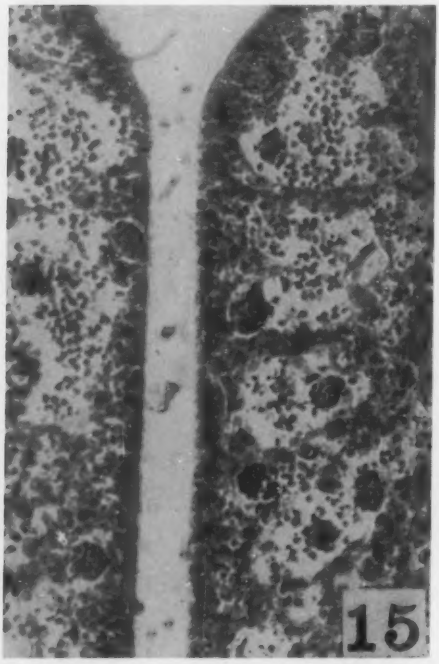


FIG. 15. Level of the third ventricle just posterior to the foramen of Monro. Note clear spaces within each of which is a large macrophage (phagocyte) cleaning up the cellular debris.

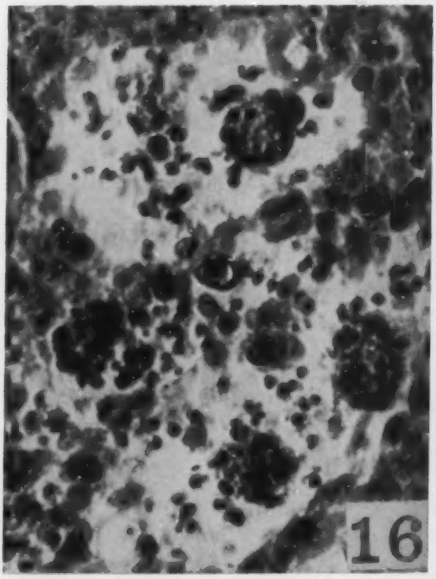


FIG. 16. Enlarged section from Fig. 15. Each macrophage contains numerous dead cells and nuclei. Ependyma relatively intact.

FIG. 17. Level just posterior to the anterior ventricles showing the interventricular foramen and part of the third ventricle. Note areas of damage made acellular by activity of phagocytes.

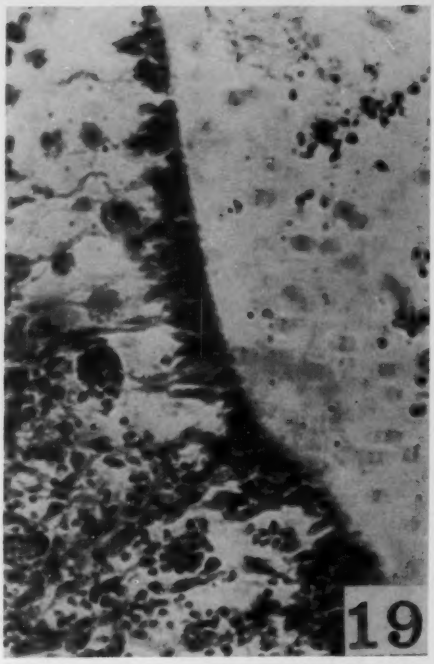


FIG. 19. High power view of part of Fig. 18.. Note intact ependyma.

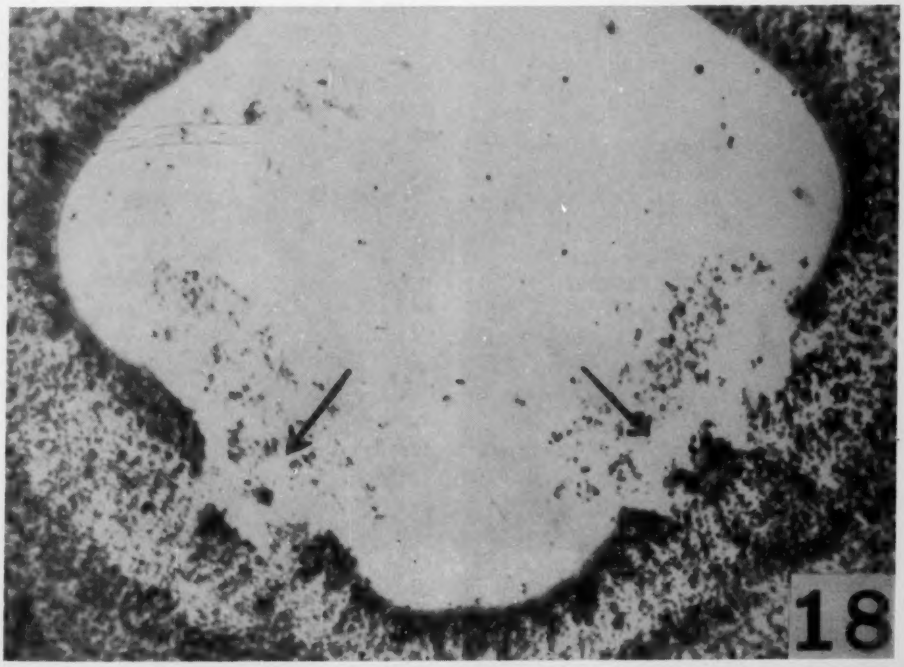


FIG. 18. Metencephalon (at level of tegmentum of the pons) with area just peripheral to ependyma filled with dead cells and pycnotic nuclei. Note paired dorso-lateral ruptures in the metencephalic roof indicating regions of concentrated or active differentiation.

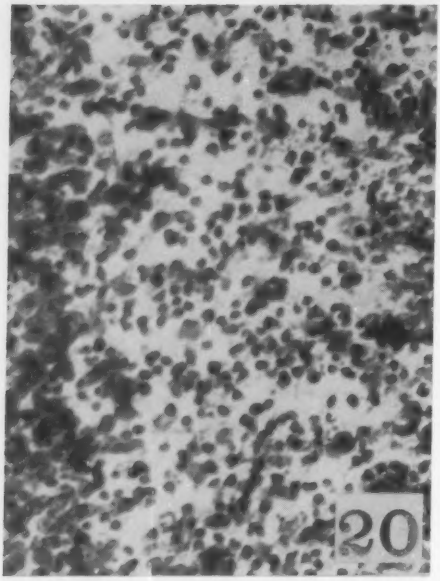


FIG. 20. Developing brain lateral to the posterior horn of lateral ventricle showing wide area of pycnosis. High power view from Fig. 21.

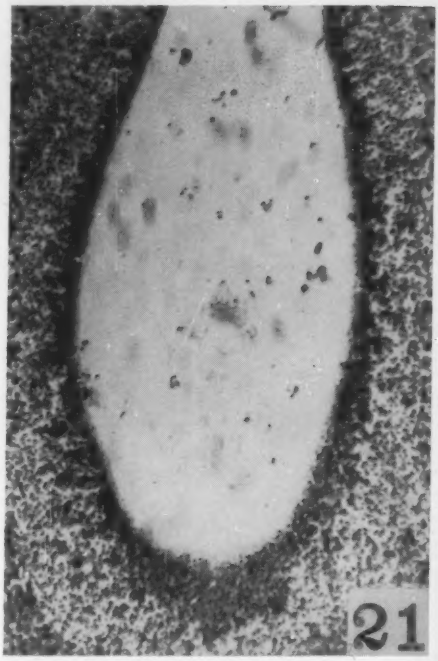


FIG. 21. Posterior horn of the lateral ventricle showing intact ependyma.

of the brain is not nearly so severely damaged as is the telencephalon supports the thesis that it has achieved prior differentiation.

The metencephalon with its fourth ventricle is very radiosensitive but not uniformly so (Figs. 18, 30). There are paired dorsal interruptions in the ependyma (Fig. 18) by 24 hours following x-radiation, which may be related to the differentiation of the efferent nuclei. The inner nuclear layer, adjacent to the ependyma, appears to be so severely damaged that the tissue macrophages (phagocytes) are actively cleaning out the dead cells (Fig. 19). More peripherally the intermediate layer (Fig. 20) shows abundant pycnotic nuclei and, still more peripherally, some living and dead nerve cells. The walls of this fourth ventricle are variously affected (Figs. 32, 33).

The myelencephalon, which becomes the medulla and contains the posterior extension of the fourth ventricle, is not so severely damaged probably because it is less active in differentiation at the time of insult. The ventro-lateral ependymal floor is interrupted in a bilateral manner suggesting the early origin of the 9th or 10th cranial nerves (Fig. 31). But there is relatively little cellular debris as compared with other sections of the brain.

The spinal cord. The spinal cord of the 13.5 day fetal mouse has achieved its primary organogeny, with clear cut division into mantle layer and an elongate vertical neural canal. One can distinguish the ependyma from the mantle cells, and there is already some lateral and ventral white matter (axones). Dorsal root ganglia are developing and sending their processes into the cord.

Four hours following x-radiation to 300 r the spinal cord of the fetus of 13.5 days shows areas of pycnosis directly dorso-lateral and dorsal to the neural canal, peripheral to the ependyma (Figs. 34, 37). If pycnosis following irradiation is the criterion of a cell

in the process of differentiation, it is apparent that most of the ependyma has already differentiated by this time. There are regions, toward the dorsal side (Fig. 37) where even some ependymal cells appear to be radiosensitive and hence damaged by this dose. Many damaged cells and nuclei are seen extending out into the mantle layer a short distance, but the bulk of the neurones and astrocytes of the mantle layer are definitely radioresistant. It is difficult to identify a pycnotic mass as being derived from one or another type of cell, but since both neuroblasts and spongioblasts are known to be in adundance in the region of radionecrosis it is presumed that both are damaged. It is apparent that at the time of radiation insult that the most active differentiation is occurring dorsally and dorso-laterally to the neural canal, outside of the ependyma. This is consistent with the fact that the neural tube closes dorsally and that that portion of the cord should lag behind the ventral with respect to differentiation.

Under higher magnification (Fig. 41) the large nuclei of the fully-formed (neurone) cell bodies can be distinguished from the smaller nuclei of the astrocytes and oligodendroglia. There are some obvious dead (neuroblast?) cells and many scattered pycnotic masses. The dorsal root ganglion (Fig. 44) also contains pycnotic nuclei among fully differentiated neurone cell bodies. These are, no doubt, neuroblasts from which processes would normally grow into the cord and also outwardly to the spinal nerve.

By 24 hours after exposure the spinal cord shows further gross development, with the neural canal being narrowed and reduced in dorso-ventral length (Figs. 35, 38). In the areas previously seen to be filled with pycnotic nuclei there now appears to have been a reduction in the congestion. Clearing away of the debris has occurred by active phagocytosis, achieved by tissue macrophages (Fig. 42). Mitosis, although not obvious,

(Continued on page 557)

PLATE III. SECTIONS OF MOUSE BRAIN 72 HOURS FOLLOWING EXPOSURE TO 300 R X-RAYS AT 13.5 DAYS GESTATION

FIG. 22. Low power veiw of anterior brain section showing corpus striatum, thalami, and third ventricle with breaks in the ependyma.

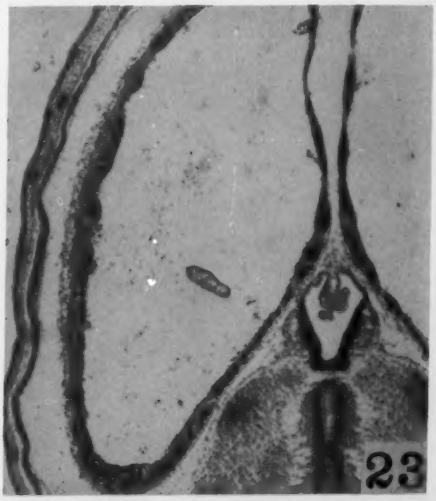


FIG. 23. Anterior horn of lateral ventricle with practically no development in the 72 hours following x-radiation except the formation of some rosettes. Much of the cellular debris has been cleaned up by phagocytes.

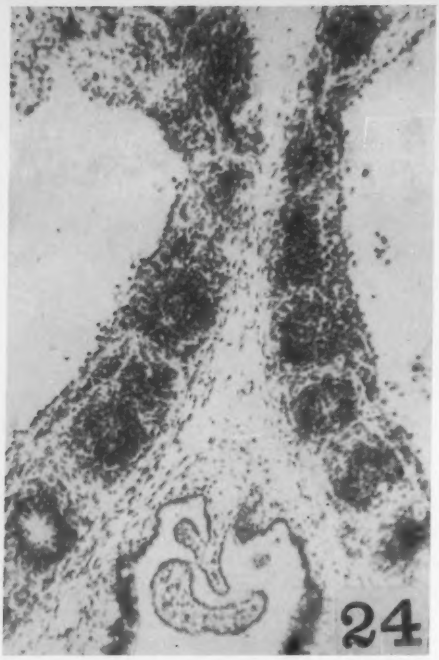


FIG. 24. Region of developing cerebral lobes (anterior telencephalic ventricles) showing rosette formation throughout and relatively acellular column of fornix.

FIG. 25. Anterior horn near level of foramen of Monro. Note fewer rosettes than in Fig. 24.

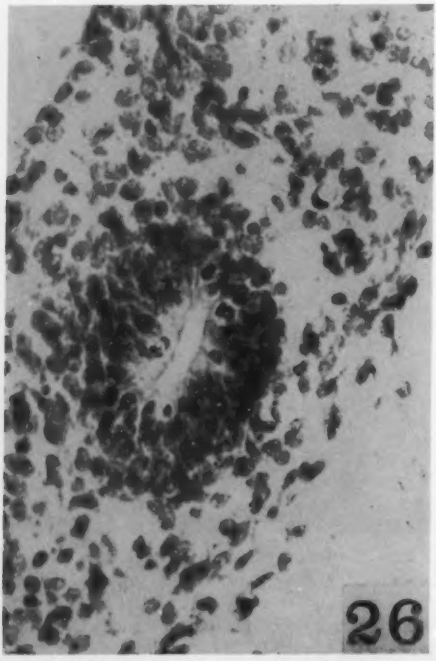


FIG. 26. Enlarged view of single rosette showing two rather normal anaphase figures.

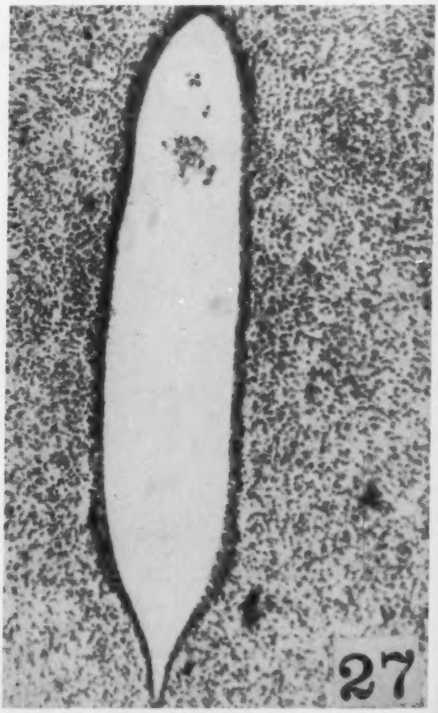


FIG. 27. Mid-brain level showing a residuum of a few desquamated cells into the third ventricle and, at this level, rather intact ependyma.

FIG. 28. More posterior aspect of third ventricle. Note damage to the lateral walls but rather intact dorsal and ventral walls. Much of the cellular debris has been removed.

FIG. 29. Half of the metencephalic roof, intact except for the ventro-lateral region which is probably point of origin of trochlear nerves.

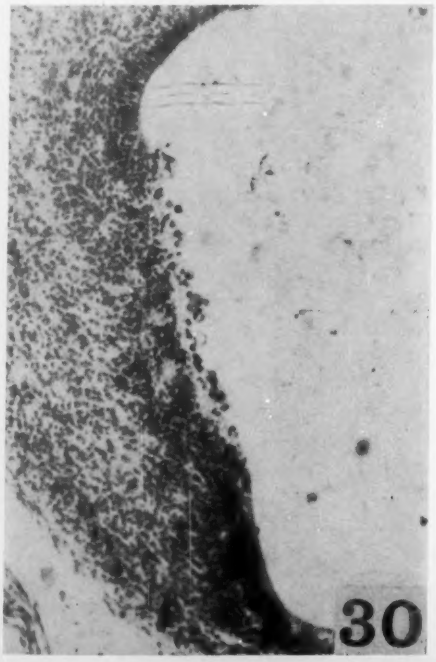


FIG. 30. Metencephalon with rupture of specific and limited regions of its lateral wall.

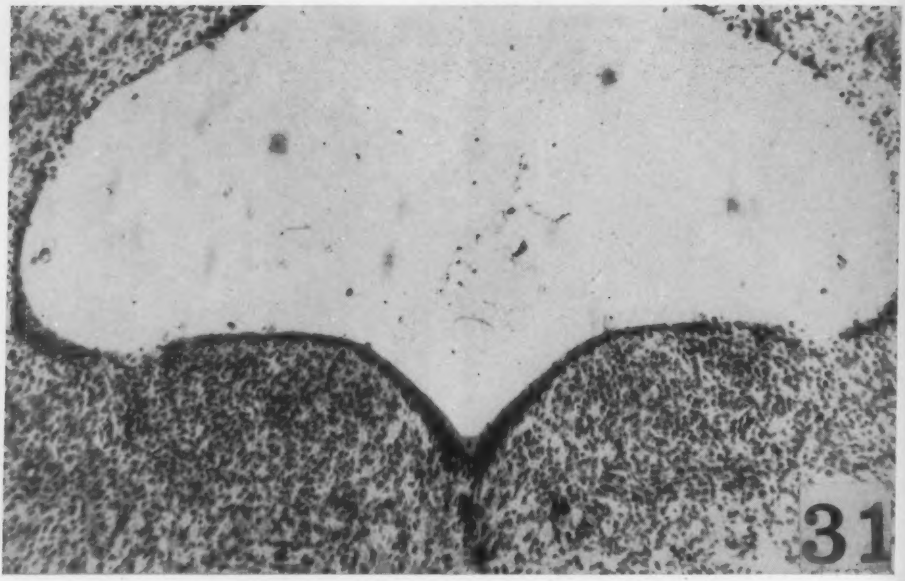
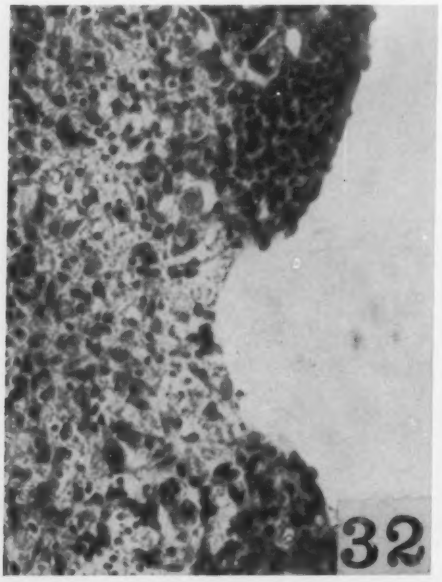
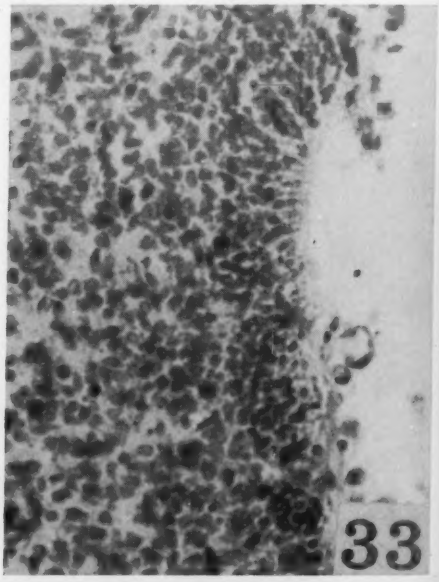


FIG. 31. Myelencephalon, with broken ependymal wall and failure in development.

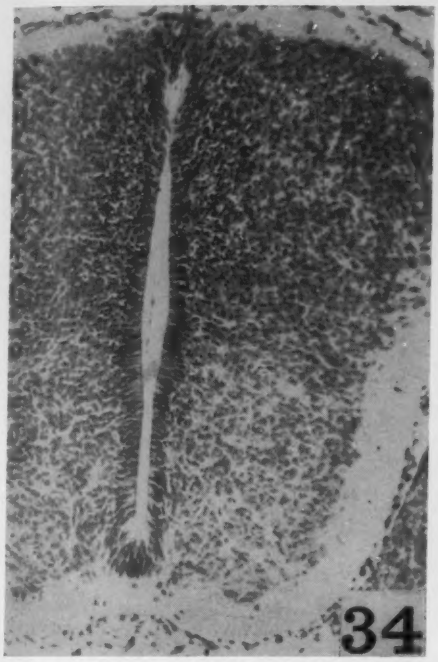


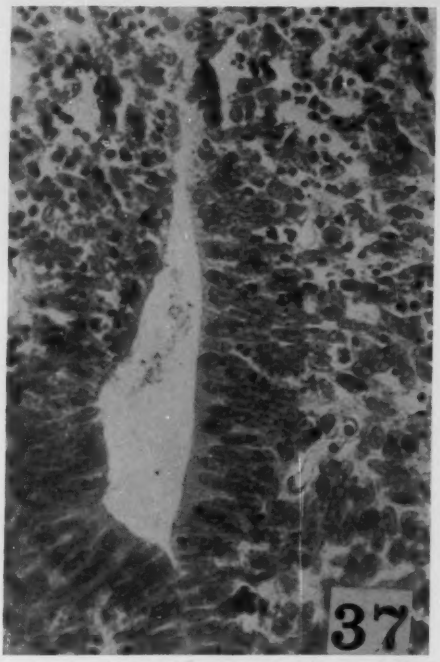


FIGS. 32, 33. Enlarged view of wall of metencephalon showing (Fig. 32) interruption of development and (Fig. 33) attempted rosette formation. In the latter instance there are but few pycnotic cells as compared with Fig. 32.

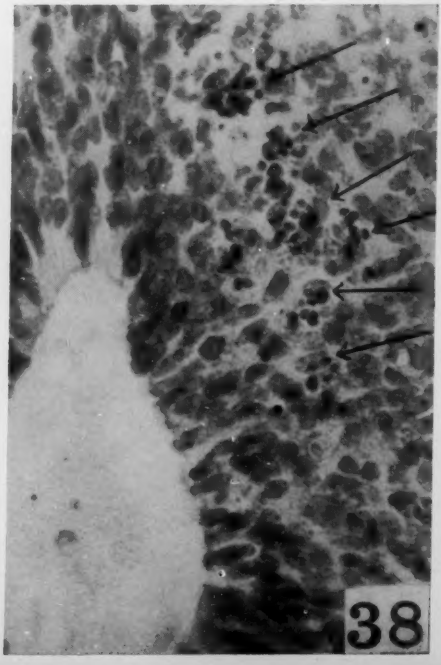
FIGS. 35, 38. Spinal cord 24 hours after exposure. Cellular and nuclear debris being actively cleaned up by macrophages (phagocytes).

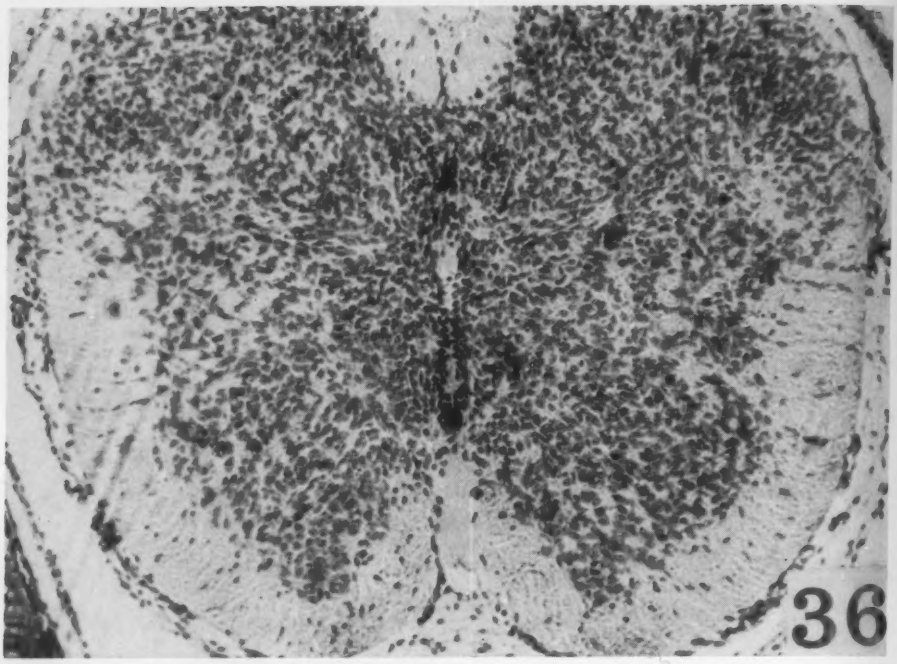
PLATE IV. SECTIONS OF MOUSE SPINAL CORD AT 4, 24, AND 72 HOURS FOLLOWING EXPOSURE TO 300 R X-RAYS AT 13.5 DAYS GESTATION

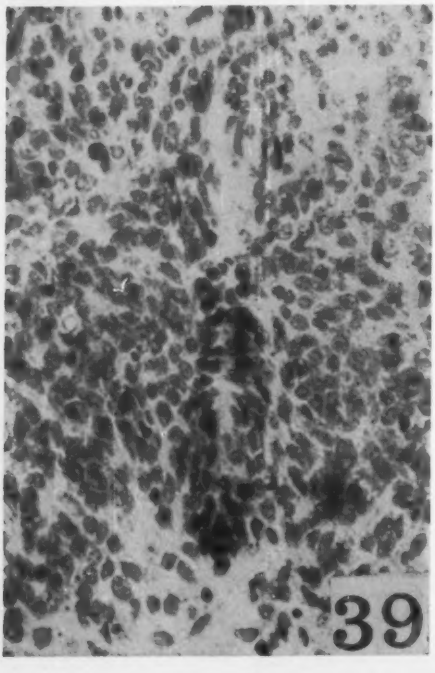




FIGS. 34, 37. Spinal cord 4 hours after exposure. Ependyma well differentiated, hence radioresistant. Mantle layer contains both recently formed neurones, astrocytes and oligodendroglia which are resistant to 300 r x-rays, and also neuroblasts and spongioblasts which are pycnotic and karrorhectic, hence radiosensitive. Major differentiation activity at time of radiation insult is in neuroblasts located dorsal and dorso-laterally to the ependyma, in the region of developing commissural fibers associated with the dorsal root tracts.







FIGS. 36, 39. Spinal cord 72 hours after exposure. Note total absence of dead cells and nuclei and residual disorganization of the ependyma. Fully formed neurones, astrocytes and oligodendroglia of the mantle layer appear to be unaffected. Compare with Fig. 40.

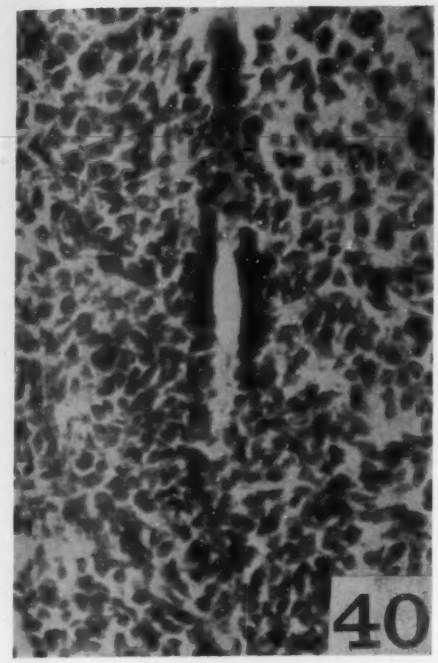


FIG. 40. Control central canal of age comparable with Figs. 36 and 39 at 16.5 days gestation.

must have occurred because of the increase in the mantle layer mass. The debris has been cleaned up from the dorsal root ganglion also (Fig. 45).

By 72 hours after exposure there is only slight evidence of further growth (expansion) of the spinal cord, the general volume of the mantle layer being much the same as at 24 hours (Fig. 36). All of the nuclear and cellular debris has been cleaned up by the macrophages (Figs. 39, 43) and the dorsal root ganglion appears to be quite normal (Fig. 46). If, however, one compares the neural canal and the cells in its vicinity in the x-irradiated fetus (Fig. 39) with that of a comparable aged control (Fig. 40) it is obvious that while the cellular debris has been eliminated there has been imposed upon the spinal cord a genuine disorganization. This is reflected not only in the disarrangement of cells and nuclei but of the contour of the neural canal and its lining ependyma. Thus, while there are cells of the developing spinal cord (such as the ependyma) which do not exhibit immediate damage following irradiation, they become secondarily affected by 72 hours and the cord appears to be quite abnormal.

It should be stated here that many of the fetuses exposed to 300 r at 13.5 days will come to birth but will invariably die before the end of the first day. The same exposure given to fetuses 24 hours later (i.e., at 14.5 days gestation) will allow most of them to survive birth for at least six weeks. Thus, the dose and stage chosen for these observations constitute the maximum tolerable conditions that will allow fetuses to reach birth, but not survive.

DISCUSSION

The radiosensitivity of the nervous system has been variously reported. There is currently a debate as to whether the adult central nervous system (brain, etc.) is extremely radioresistant and the only pathway of effect is secondarily through the radionecrosis of the blood vessels. (Hicks and Montgomery '52, Hicks '53, McLaurin et al. '55). In 1950 Hicks stated that "the developing brain is by far the most radiosensitive tissue in the rat and mouse fetus in the latter half of gestation." Recently Hicks ('54) has made the statement that acute radionecrosis of the adult neurones rarely occurs with doses less than 1500 r and that very few neurones are destroyed even by doses as high as 15,000 to 20,000 r. The neuroblast, so abundant in the fetus, may be made necrotic within 4 hours by as little as 40 r x-rays. It is therefore apparent that one must distinguish as to what step in neurogenesis is under investigation. Hicks ('53) stated that of the four stages in neurogenesis (neurectoderm, neuroblast, immature neurone, and adult neurone) "only the neuroblast is radiosensitive" and this is because the neuroblast is particularly concerned with the production of nucleic acids and proteins in the process of differentiation. Mitosis is not a factor because many of the neuroblasts are not in a state of division at the time of radiation insult and yet they are damaged.

PLATE V. SECTIONS OF MOUSE SPINAL CORD AT 4, 24 AND 72 HOURS AFTER EXPOSURE TO 300 R X-RAYS AT 13.5 DAYS GESTATION

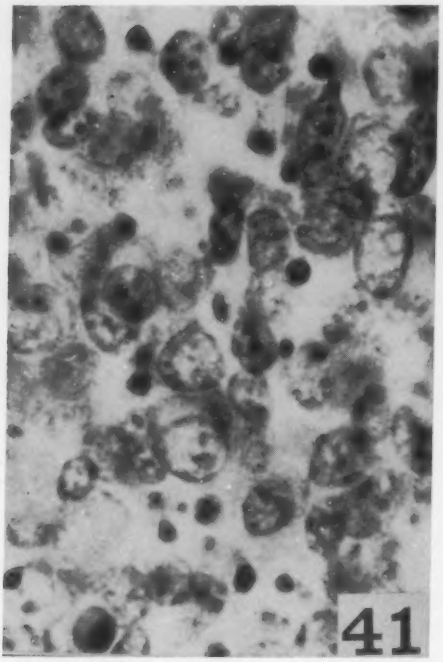


FIG. 41. High magnification of mantle layer from Fig. 34 showing cell bodies with their large nuclei, astrocytes and oligodendroglial cells with their smaller nuclei. Note also large and small pycnotic masses representing chromatin of neuroblasts and spongioblasts damaged by radiation.

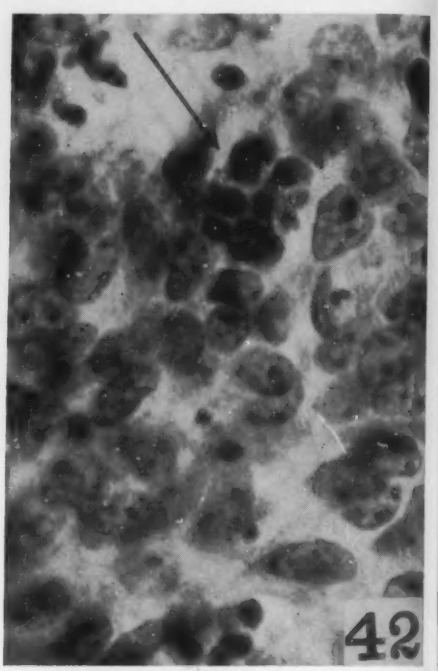


FIG. 42. High magnification of mantle layer from Fig. 38 showing one large tissue macrophage phagocytically ingesting cellular debris.

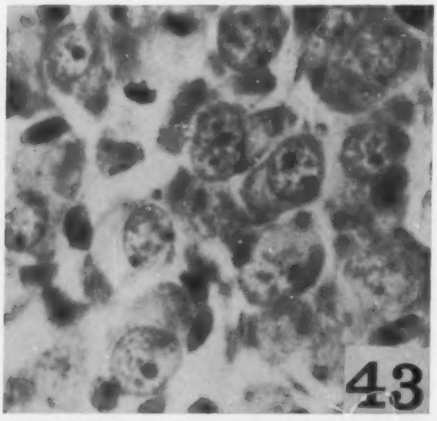


FIG. 43. High magnification of mantle layer from Fig. 36 showing very few damaged nuclei and the presence of one mitotic figure among fully differentiated neurones, astrocytes and glia cells.

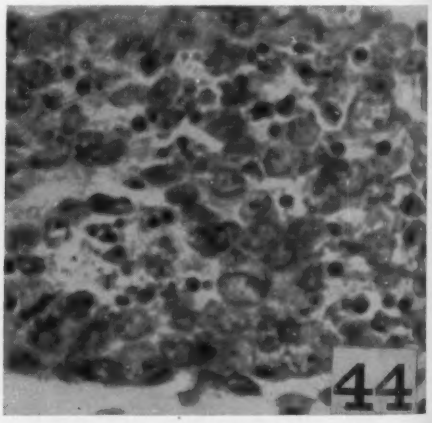


FIG. 44. Dorsal root ganglion 4 hours after radiation, showing abundant damaged (pycnotic) neuroblasts amidst fully formed, radio-resistant cell bodies of neurones.

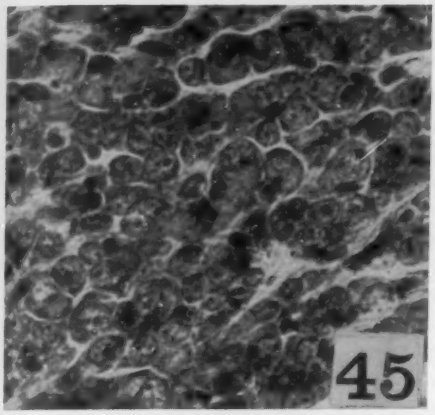


FIG. 45. Dorsal root ganglion 24 hours after radiation showing very little residual damage from radiation.

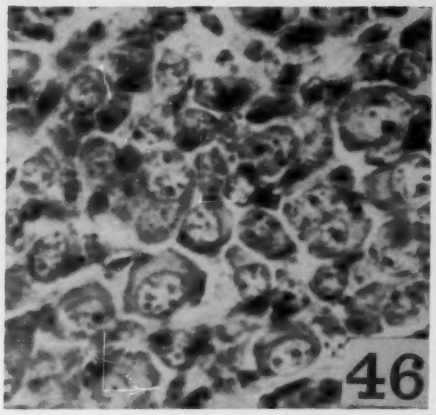


FIG. 46. Dorsal root ganglion 72 hours after radiation showing almost complete absence of damage. Cellular debris has been almost entirely removed by this time.

The mouse embryo of 8 days appears to be able to withstand considerable radiation insult. This is probably due to the fact that very little differentiation is occurring. It is during the next several days (9-14) that the major organ systems are layed down and in close association with them there develops the neurological basis for their control. Thus, neuroblasts first appear about the 9th day and are present in various parts of the developing embryo and fetus until some time after delivery.

By 13.5 days the five major divisions of the brain, from the telencephalon to the myelencephalon as well as the spinal cord, have developed. The further differentiation of each of these parts toward the complicated morphology of the mature brain and cord continues until the nervous system is essentially complete, just before birth. If one could select a gestational period of greatest overall differentiation activity in the central nervous system it would probably be day 13.5. Cytological evidence for such a statement is given in this paper. At any later stage fetuses can survive such an exposure as 300 r x-rays, hence are less radiosensitive.

The marshalling of macrophages which act as scavengers of cell debris, occurs maximally at about 24 hours after the radiation insult. These remarkable migratory cells do a very efficient job of engulfing and removing dead cells and nuclei but they cannot supplant the dead cells, many of which are necessary in morphogenesis. Thus, we find specific areas of the developing brain devoid of cells, marginal ependyma interrupted, and rosette formation which is quite abnormal. These rosettes have been previously described by Wilson et al. ('51 and '53) and Hicks ('53) and seem to be lined by normally multiplying (mitotic) neurectoderm, generally the primitive ependyma. It is possible that the rosette formation is the direct result of interruptions along the ependyma where differentiating neuroblasts are destroyed, thus reducing the linear tension and giving way to concentrated activity of clusters of the undamaged neurectoderm. In any case, these are found most abundantly in the periventricular regions of the presumptive cerebral lobes and, at the dose of 300 r used they persist. No doubt this degree of disorganization of the brain tissue as well as cytolysis of the neurogenic elements caused by 300 r on day 13.5 is partly, if not wholly responsible for the neo-natal death of the mouse.

There is functional evidence of neurological damage by x-rays to the fetus which is difficult to quantitate. Mice of different fetal

ages exposed in utero to x-radiation from 100 r upwards, and which survive birth, will invariably exhibit nervous behavior. The degree of excitability is directly related to radiation dose and inversely related to fetal age. This can be demonstrated by placing fetal-irradiated mice of 2 or 4 weeks of age alongside controls of the same age and stimulating them to motile activity by mild electric shock. One can easily pick out those mice which had been irradiated in utero as the most nervous, irritable, unstable. Such activity is difficult to evaluate but is nonetheless real. When it is possible to demonstrate, as is done here, that a dose of 300 r leads to such extensive disruption of the developing central nervous system that repair is impossible, it is logical to presume that lower doses might have functional sequelae without necessarily there being morphological corollaries. Investigations of rodents following exposure to low x-ray doses while in utero, in psychological testing mazes, might reveal sub-morphological changes. Some work along this line has been reported by Tait et al. ('52). Hicks says ('53), in this regard, that "from the social viewpoint it is probable that the production of an individual with a subnormal brain may be a worse catastrophe than one with almost no brain." The degree of radiation damage to nervous tissue following 300 r on day 13.5 is just lethal, but the lowest level of radiation which produces a functional effect on the nervous system has not been established. Recent reports of follow-up studies on Hiroshima children x-radiated in utero, are suggestive (Plummer '52, Sutow '53, Reynolds '54).

Summary and Conclusions

1. The fetal mouse of 13.5 days cannot survive an exposure of 300 r x-rays beyond the first day after birth. This is the minimum 100% lethal dose for the 13.5 day fetus.

2. This dose does not alter the activity of tissue macrophages which do an efficient job of cleaning away the abundant neuroblast and spongioblast debris, but when this is done there is not sufficient undamaged neurectoderm to replace the damaged cells and allow normal continuation of morphogenesis.

3. There is sufficient neurological evidence for the lethal effects of this radiation, since the organism is unable to repair the amount of damage incurred to the developing central nervous system.

4. Certain areas of the brain are more radiosensitive at 13.5 days fetal age than are others as determined by such an histo- and cytological study. This is taken to indicate regions of high activity in differentiation and it is suggested that x-radiation could be used to map differentiation areas at different stages of fetal development.

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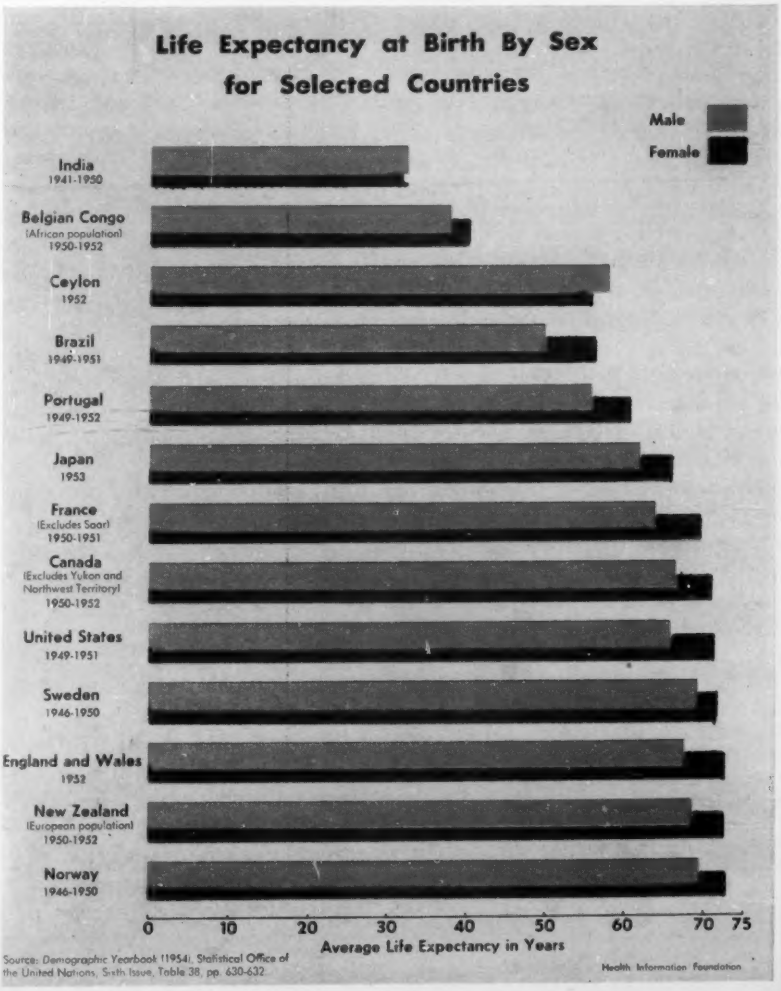

Parenteral Trypsin Therapy for Thrombophlebitis, Thromboembolism, and Chronic Venous Occlusion of the Lower Extremities: Results in Thirty-Two Cases at Brooke Army Hospital

By

MAJOR ANTHONY J. PUGLISI, USAF (MC);* ALBERT W. HARTMAN, M.D.;†
COLONEL WARNER F. BOWERS, MC‡

Introduction

FROM a review of the literature,[1-6] it seemed that our results in thrombophlebitis and thromboembolism might be improved by trypsin therapy and we were especially desirous of helping the many patients we see with chronic venous occlusion (postphlebitis syndrome) as a result of war wounds. Consequently, three years ago this study was undertaken, the results of which are reported herein.

MATERIALS AND METHODS

The first twelve patients in our series of thirty-two were treated with intravenous trypsin or Enzar (Armour) which is the lyophilized, purified crystalline extract of trypsin for intravenous use. The remaining twenty patients were treated with Parenzyme, a sesame oil suspension of purified trypsin for intramuscular use, manufactured by the National Drug Company. The patients being treated with intravenous trypsin received 200,000 units (approximately 100 mg.) of Enzar given once a day over a three to four hour period. Those receiving Parenzyme received 1 cc. or 5 mg. every six hours. The duration of therapy depended on the type case being treated and the clinical response to the therapy. The average length of treatment in acute thrombophlebitis was five days; in chronic recurrent thrombophlebitis, ten days; pulmonary embolism, seven days; and in chronic venous occlusion of the lower extremities (postphlebitic syndrome), therapy continued up to four months utilizing weekly maintenance doses of 1 cc. or 5 mg. of Parenzyme after a daily dose of 1 cc. every six hours for seven days. Additional therapy included only bed rest until clinical improvement occurred, and elevation of the affected extremity.

Our clinical material is classified in the following groups:

Group I (5 cases). These patients developed acute thrombophlebitis after the following surgical procedures: left lower lobectomy and lingulectomy; radical mastectomy and bilateral oophorectomy; subtotal gastrectomy; and two exploratory craniotomies.

Group II (15 cases). These patients entered the hospital with a diagnosis of acute thrombophlebitis or developed it on bed rest.

Group III (7 cases). These patients entered the hospital with a diagnosis of chronic recurrent thrombophlebitis.

Group IV (5 cases). These cases of chronic venous occlusion or old postphlebitic syndrome, represent the cases we were particularly interested in treating with Parenzyme. Such cases always have been extremely difficult to improve and we were anxious to determine whether or not we could influence the venous insufficiency and its accompanying clinical picture.[7]

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This series does not include cases associated with renal disease, hemorrhagic tendencies, hepatic disease, or blood dyscrasias. All of the thirty-two patients were followed with laboratory studies including total blood protein and albumin-globulin ratio, white blood count and differential count, blood sedimentation rate, prothrombin time, Lee White coagulation time, hemoglobin, hematocrit, gamma globulin, bleeding time and clotting time, blood glucose, and blood urea nitrogen.

Results

In the five patients developing thrombophlebitis after surgery, two developed pulmonary embolism, one prior to trypsin therapy and one during trypsin therapy. The former was the case of a middle-aged male who, two weeks after craniotomy for cerebral neoplasm, developed deep femoral thrombophlebitis on the right with clinical and x-ray evidence of pulmonary embolism. He received seven days of trypsin therapy and showed clearing of the thrombophlebitis and x-ray evidence of improvement of the pulmonary infarcts but expired two weeks after trypsin therapy. At autopsy, the cause of death was found to be hemorrhagic brain necrosis, secondary to the original surgery, and neoplastic process. The lungs were examined and the recent infarcts were noted, but felt not to be the cause of death. The latter case was that of a sixty-three year old male who underwent a subtotal gastrectomy for intractable ulcer. Immediately following surgery, he developed a severe cellulitis of the left hand and arm following intravenous therapy in that region. This necessitated prolonged bed rest and he developed thrombophlebitis of the deep calf veins on the left ten days after surgery. He received seven days' treatment with trypsin, and while on it developed clinical and x-ray evidence of pulmonary embolism which improved, along with the thrombophlebitis, while on continued trypsin therapy. He was discharged from the hospital, only to return several days later to expire five weeks after his surgery. X-ray of the chest at the time of readmission showed the persistent infarct shadow had improved and examination of the left calf area failed to reveal the presence of any remaining thrombophlebitis. He expired of overwhelming toxemia and a subacute bacterial endocarditis. At autopsy the embolic process with infarct was noted to have begun healing and was not felt to be recent enough or large enough to have brought about his death.

Of the remaining three cases developing thrombophlebitis after surgery, and of thirteen of the fifteen cases in Group II, all responded well, this response being early and rather remarkable in comparison with our past experience. On the average, pain, tenderness, and localized erythema and warmth were improved in twenty-four hours and disappeared completely in three days. The swelling and edema also began improving early, but were a little longer in clearing, averaging about six days. Homans' sign, when positive, cleared in three days. Where a thrombus was palpable superficially, several weeks were required for it to soften and disappear, but the patients were able to ambulate early in spite of its presence. Of these sixteen cases, all were able to ambulate three to four days after the onset of trypsin therapy without sequelae, and with the exception of the three postsurgical cases, had an average hospital stay of only seven days. This was felt to be considerably less than in series utilizing other forms of therapy. These patients and those of the preceding and following groups all were followed with the laboratory studies previously mentioned, with only the following significant findings: In the majority of cases treated there was a slight prolongation of prothrombin time over normal, but this was not in any case felt to be excessive or significant.[8] In cases of acute thrombophlebitis with an elevated white blood count and differential and an elevated erythrocytic sedimentation rate, response with a drop toward normal in twenty-four to forty-eight hours after the onset of trypsin therapy was seen.[8] The remaining two cases of Group II also showed a favorable response to trypsin therapy, but were

complicated by unusual circumstances and pulmonary embolism. The first was the case of an elderly Negro female dependent who was admitted to our hospital with a diagnosis of advanced adenocarcinoma of the pancreas with marked jaundice and weight loss. Shortly after her admission and while on bed rest, she developed thrombophlebitis of the left deep femoral vein and clinical and x-ray evidence of pulmonary embolism. Trypsin therapy was started and after five days she had shown improvement of the thrombophlebitis in the left femoral vein and improved clinical and x-ray evidence of pulmonary embolism. However, on the sixth day she developed acute thrombophlebitis of the right thigh veins, but no further evidence of embolism. Trypsin therapy was continued and both lower extremities cleared well, as did her pulmonary infarct as noted in serial x-rays. She expired three weeks later and at autopsy the area of pulmonary infarct was noted to be healing and was not related to the cause of death. Perhaps the explanation of the occurrence of thrombophlebitis initially and while on trypsin therapy can be related to the definite relationship that exists between carcinoma of the pancreas and thrombophlebitis. The other case in this group was a young male hemiplegic, having sustained a gunshot wound to the head. He developed thrombophlebitis and pulmonary embolism. He was placed on trypsin therapy and responded remarkedly with complete clearing of his thrombophlebitis in four days and gradual complete clearing of the infarcted areas of the right lung.

In the Group III cases, six of the seven cases of chronic, recurrent thrombophlebitis also responded well to trypsin therapy, though in general, more slowly.[9] In this group, we refer to patients who have had one or more previous episodes of thrombophlebitis with minor or no residuals therefrom. These were acute recurrences of chronic thrombophlebitis. Their response simulated that mentioned above and was as complete for the acute recurrence of the disease, though on the average the response was later and length of hospitalization was two to five days longer. When the acute recurrence cleared, any residuals of chronic thrombophlebitis that had been present initially (mild edema, brawny skin discoloration, etc.) still remained. The one other case in this group represents our one major complication of the entire series. This forty year old white female with the history of chronic thrombophlebitis developed an acute recurrence in her right leg accompanied by pain, swelling, erythema, calf tenderness, and tenderness along the femoral vein. Trypsin therapy was started and on the seventh day she developed two pulmonary emboli with evidence of acute thrombophlebitis of the left leg. Since this was an early case in our series, we were rather discouraged and trypsin therapy was discontinued. The patient was taken to surgery for a bilateral femoral vein ligation. Dicumerol therapy had been started prior to surgery, but before the prothrombin time could be reduced to therapeutic levels, the patient began hemorrhaging from her right groin incision quite markedly. In spite of discontinuance of dicumerol therapy and administering fresh blood and vitamin K, she continued to have episodes o hemorrhage. During this time and with th treatment we had considerable difficul maintaining normal prothrombin level After two weeks of this extremely diffic problem, we gave the patient cortisone a immediate improvement followed. The tient continued well thereafter.

One other case in this group is wort mention, for she represents not a failure trypsin therapy but a recurrence of acu thrombophlebitis in spite of previous try sin therapy. She was an obese, bedri seventy year old white female who develo her first episode of acute thrombophlebit two years ago after having taken to be following a back injury. She was treate with trypsin, responded well, and was o of the hospital in a week. She continued t remain a bed patient and last year developec a recurrence of her thrombophlebitis in the same area, the left saphenous vein. She again was placed on trypsin therapy, again

responded well, and was home in a week. She was readmitted ten months later with her second recurrence in the same area and of the same degree. Trypsin therapy again caused prompt remission.

In the Group IV cases, we were interested in whether or not we could improve the venous insufficiency and its sequelae. After trypsin therapy we observed no effect at all. Other series have reported some improvement which we did not see.[4, 9, 11] In the first two cases of the group, there was a pre- and post-therapy venogram and we were able to demonstrate no change in the venous obstruction pattern. Since we could not produce clinical improvement, venograms were not made in the other cases. One of these five patients displayed the only allergic response to trypsin in the series. His was a delayed, mild allergic response to weekly injections of Parenzyme after having been on the medication for two months. This reaction was manifested by itching and urticaria developing six to eight hours after his weekly maintenance dose of Parenzyme and subsided without medication in forty-eight hours. After this developed on three successive occasions, the therapy was discontinued.

Comments and Discussion

The results in this series utilizing both the intravenous and the intramuscular trypare similar, but we prefer the intrascular preparation, as do others who have both preparations. Parenzyme is easier administer and is attended by a lower idence of local reaction at the site of inction. In this series this developed in ur cases. These reactions of swelling, ined warmth and erythema at the site of jection could be further reduced if the jection were given sufficiently deep intranuscularly. The dosages of trypsin used in ur series may be considered high when conrasted to dosages used in other series with equally favorable results. We plan to lower the dosage in treatment of future cases but wanted to maintain it uniformly for this series. There was a total of five cases of pulmonary embolism in this series, three cases being treated for it with trypsin and two cases developing it while on trypsin therapy for thrombophlebitis. Other series have reported this also.[10, 5] Two of our patients developed thrombophlebitis in the opposite leg also while on trypsin therapy. The reason for this is unknown. We have observed the anti-inflammatory effect of trypsin and in cases unattended by inflammation, trypsin had no other effect. It probably does not prevent thrombophlebitis and/or pulmonary embolism, but has an effect on these entities once they occur. In this series, there were no deaths from pulmonary embolism, nor any deaths resulting from trypsin therapy or the failure of it. If trypsin has the fibrinolytic effect that is reported, perhaps there is less residual following a case of thrombophlebitis treated with trypsin. Aside from the cases that terminated fatally, only one patient in our series has returned with a recurrence of thrombophlebitis. Because of a recurrence in only one case after trypsin therapy, we have not placed any of our patients with chronic recurrent thrombophlebitis on maintenance doses of trypsin as advocated by some.[9]

Summary and Conclusions

Parenteral trypsin was used in thirty-two cases for treatment of thrombophlebitis, thromboembolism and postphlebitic syndrome. In cases of acute thrombophlebitis and/or embolism, the responses were very favorable and rapid, comparing with other series. The cases of chronic recurrent thrombophlebitis responded well also, but more slowly. There was no effect in the cases of postphlebitic syndrome treated.

Morbidity and length of hospitalization were improved in the cases treated in this series. From a laboratory standpoint, the response to trypsin therapy was not adverse, and clinically trypsin therapy was unattended by severe reactions. Intravenous and intramuscular trypsin both were utilized but we prefer the intramuscular preparation for its ease of administration and decreased incidence of local reaction at the

site of injection. Deep intramuscular injection is urged.

When compared with other series using anticoagulant therapy, trypsin therapy is simpler, more adequate, safer, and does not require the close laboratory follow-up during treatment. In another study, it is reported that embolization and postphlebitic complications are fewer.[12]

These results warrant continued use and study of trypsin therapy in these diseases.

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To dress a soldier you need the wool from three sheep and the hides from ten taxpayers. Faecke cartoon, *Frankfurter Illustrierte,* Germany.

We must not make the disastrous mistake of underestimating the task that faces our Army today. Despite the ostensible "new look" of the communist conspiracy—its freshly gilded promises and tawdry smiles, its artful retreading of belligerence into benevolence—there is not the slightest evidence to justify a belief that the communists have modified in any degree their ruthless determination to subjugate the entire Free World by whatever means they can. Backing that determination is the steel of the largest mobilized armed forces on earth —growing in size and power with each passing day.

Remarks by the Honorable Wilber M. Brucker,
Secretary of the Army,
United States Armor Association,
Fort Knox, Kentucky,
April 27, 1956.

Traumatic Osteochondritis of the Knee

By
ROBERT C. CORNELL, M.D.

INTERNAL derangement of the knee joint is one of the most common and vexing problems confronting the military surgeon. Many man hours are lost and not infrequently members of the Armed Forces are surveyed to inactive duty or out of the service because of disabling knee conditions. The large incidence of internal derangement of the knee joint in members of the Armed Forces is not surprising in view of the fact that the vast majority of enlisted personnel are taken from high schools and colleges, and are in that particular age group in which one so frequently finds injuries to the knee resulting from athletic injuries. Furthermore, the nature of military service, the numerous small traumatic episodes occurring in basic training, and the rigors of military activities predispose to injuries of the knee joint.

It is the purpose of this paper to discuss traumatic osteochondritis of the knee, particularly from the view point of treatment and rehabilitation of military personnel. The major part of the material obtained for the paper resulted from studies of 166 arthrotomies of the knee, performed by the author and consequently the material herein presented is unabridged. Of these 166 patients who underwent arthrotomies of the knee, fifty-five had osteochondritis of the knee joint of sufficient severity to cause them to be disabled. The author intends to point out from a discussion of these cases, a number of facts which may aid in the subsequent treatment of osteochondritis of a traumatic nature, both in military and civilian life.

ETIOLOGY

The etiology of traumatic osteochondritis of the knee requires little explanation, however, there are certain factors which predispose to trauma of this type that are worthy of note. It is quite apparent that trauma either intra-articular or extra-articular plays an important part in the production of osteochondritis. Swenson[1] has brought out the fact that there are relative vascular deficiencies in the areas where osteochondritis most frequently occurs. In the knee joint these areas are in the contact portion of the femoral condyles and tibial plateaus. In these particular regions, the blood supply may be barely sufficient for normal wear and tear, thus any fracture in such an area might well be followed by nonunion of the overlying bone and cartilage. Repeated subclinical traumatic episodes or, a single major injury to such an area might so interrupt the blood supply of the subcondylar bone, as to result in necrosis. Balensweig[2] in discussing the etiology of osteochondritis dissecans, quotes the work of Fairbank, regarding the view that the lesion is a fracture and based his conclusion on the following facts:

(1) It occurs most frequently in adolescents and young adults indulging in vigorous activities. (2) Typical lesions are seen in radiograms and revealed by operation as definite and sometimes recent trauma. (3) A lesion at the typical sites may involve a cartilage only, the detached fragment consisting of normal articular cartilage. In such cases there is a definite history of trauma. (4) there is an entire absence of inflammatory changes in and about the osteochondritic lesion. The studies of Shipp[3] indicate apparently that trauma, either intra-articular or extra-articular plays an important part in the production of osteochondritis. Many cases occur during adolescence, which add to this theory. Paget in 1870, pointed out that necrosis without inflammation might cause a separation of such loose bodies as originally suggested in 1854, by Brocq, and others. Aside from the fact that the immediate subchondral area suffers from inadequate circulation, it should be

pointed out that in the distal extremity of the femur the bony trabeculations arise on the inner surface of the cylinder and then turn distally towards the articular surface of the condyle. Thus they become exactly perpendicular immediately above the surface of the condyle. It is believed (Shipp), that the terminal locking action of the joint in full extension serves to produce a shearing force which may injure such trabeculations.

In this series, all patients were between the ages of seventeen and twenty-eight years, all were males and therefore no inference can be made regarding age or sex incidence. It is of interest to note that of the 166 arthrotomies, eight were performed on negroes and that in five of these patients a pathological diagnosis of osteochondritis was made. The fact that sixty-three percent of the negro patients who were operated on for internal derangement of the knee had osteochondritis is worthy of further study. This small series of eight patients provides insufficient evidence to draw any conclusions, however, it is sufficient to whet one's appetite for further consideration of this problem.

Of fifty-five cases of osteochondritis of the knee, trauma was directly implicated in all instances. All of these patients had had previous injuries to the knee joint, ranging from one half to seven years prior to operation. Sixty-seven percent had sustained injuries within two years prior to surgery and the remainder had injuries occurring more than two years prior to surgery. Three patients had sustained repeated injuries dating as far back as seven years. The majority, sixty-three percent, had had only one injury, while twenty percent had had two injuries and the remaining seventeen percent had more than two injuries. Of the fifty-five patients in this series, who were diagnosed as having osteochondritis, eighty-seven percent had received prior treatment at other military installations which consisted primarily of the application of heat and supportive dressings. Four patients had previously had arthrotomies of the involved knee, with incomplete excisions of traumatized menisci.

Clinical Findings

The clinical findings in osteochondritis are little different than those found in internal derangement of the knee joint. Certain clinical findings, while not diagnostic of osteochondritis occur with such frequency in this condition that they should be emphasized. Atrophy of the quadriceps muscle was present in fifty-two patients and varied from one half to one inch. Localized pain in or immediately adjacent to the joint line was noted in thirty-nine patients and crepitus was noted in thirty-six. A positive Shearing test and a positive McMurray sign were noted in forty-five of these patients. While these latter two tests are not pathognomonic, they occur with such regularity in severe internal derangement of the knee joint that they have assumed an important role in the diagnosis, and positive reactions to these tests are almost necessary in order to make the decision to perform surgery. A history of numerous traumatic episodes to the involved joint with swelling, locking, "giving way," and pain are symptoms which are helpful in making the proper diagnosis, but as subjective complaints, should be carefully screened for their authenticity and accuracy.

X-ray Findings

X-ray findings in this series were for the most part not diagnostic. In twelve patients a diagnosis of osteochondritis could be made from the films and in five of these patients loose bodies were noted. The remaining forty-three cases had entirely negative x-ray findings when examined with a routine knee series, which included anterior-posterior, lateral, notch and skyline views. All of these patients in which roentgenographic findings indicated osteochondritic lesions were men who had had trauma of long standing and had developed extensive lesions, some with the formation of loose bodies.

Pathology

The pathological anatomy of osteochondritis is well known and requires little discussion. Early findings are, roughening of the effected area followed by softening and frequently fibrillation of the hyaline

cartilage. In advance cases the cartilage and the subchondral bone completely separates to form a loose body or may separate and remain attached by a vascular pedicle, or develop subsequent synovial attachments. The latter frequently occurs in the supra patella pouch. In the less extensive lesions particularly in adolescents, healing of the early osteochondritic areas may take place by fibrous tissue replacement, the most superficial layer of this fibrous tissue taking on the features of the peri-chondrium. Untreated cases and those with repeated trauma show progressive degenerative changes with the formation of vast, eroded areas and extensive involvement of the underlying bone. It is interesting to note that in almost half of the cases in this series, there was an associated lesion of one of the menisci and it was noted at operation that the osteochondritic lesions were so situated on the femoral condyles that they came in direct contact with the torn and displaced portion of the meniscus. From this one may draw the obvious conclusion that the displaced meniscus resulted in repeated trauma to the articulating cartilage as it became impinged between the femoral condyle and the tibial plateau. This finding, in the author's opinion, is of paramount importance and emphasizes the need for early diagnosis and surgical removal of torn and traumatized menisci. In reviewing the pathology, occurring in this series, one notes that osteochondritis of the inferior surface of the patella was found in thirty-six cases and was the primary pathological finding in fourteen. A review of the historical background of these fourteen patients revealed that their initial injury was that of a blow on the patella, or as it was in six instances, trauma resulting from explosive forces such as a land mine, bullet wounds in the lower third of the femur and in one instance the patient was kneeling on the deck of a ship when a torpedo struck the hull, immediately beneath him.

Treatment

The treatment of choice in traumatic osteochondritis of the knee is surgical excision of the osteochondritic lesion. All of the cases in this series were therefore treated by arthrotomy and excision of the damaged cartilage and where necessary the necrotic subchondral bone. The operative technique was as foliows: after a routine thorough preparation of the skin, a pneumatic tourniquet was applied and a medial or lateral para-patella incision made as indicated. The original incisions were one and one half inches in length and were lengthened proximally only when it was necessary to expose the inferior surface of the patella. The menisci when damaged were removed in toto and the osteochondritic areas thoroughly curetted to bleeding bone. The margin of the cartilage was beveled with a bent Beaver blade to an angle of approximately 30 degrees. In most instances it was necessary to drill the bone in order to increase the circulation to the damaged area. Prior to closure, the joint was thoroughly washed with normal saline, and inspected for further pathology. All closures were done with interrupted 00 black silk, closing the synovial membrane and capsule simultaneously. Pressure dressings of sterile cotton and ace bandages were applied from the toes to the groin, and the tourniquet removed. All patients received 250 milligrams of Terramycin four times a day post-operatively for ten days.

Post-Operative Care

It is the author's considered opinion that the post-operative care of patients having had an arthrotomy of the knee joint is by far the most important phase of the treatment. Regardless of how carefully the surgery has been performed, quadriceps function is completely disorganized. This reflex inhibition of the quadriceps varies considerably in degree and results in rapid muscle wasting and consequently the knee joint is inadequately protected from the strains and twists of normal weight bearing. Thus the knee joint becomes unstable, the ligaments, capsule and synovial membrane are subjected to repeated stretching and effusion results. Post-operative therapeutic procedures are designed pri-

marily to strengthen the quadriceps muscle but must also include, to a lesser degree, the muscles involved in the action of the hip and ankle joints. The immediate treatment is that of active non-weight bearing quadriceps setting exercises intended to overcome the initial reflex inhibition resulting from the surgical trauma. These exercises are started on the first post-operative day and are followed by straight leg raising and knee flexion exercises, as soon as the patient is sufficiently free of pain to make these exercises possible. By the beginning of the second post-operative week, the great majority of patients are ready for progressive resistance exercises although these must not be started until the patient is capable of full extension of the knee voluntarily. It should be remembered that the vastus medialis is most selective in its action and is responsible for the final ten to fifteen degrees of knee extension. This last effort in extension is most important in stabilizing the knee joint in weight bearing and most particularly in walking. Progressive resistance exercises are carried out with the use of the DeLorme Boot with gradual increase in the weight requirement until the patient is capable of lifting weights ten pounds in excess of that which he can do on the normal extremity.

Early, careful weight bearing with or without crutches is encouraged in post-operative meniscectomies, however, in those patients who presented osteochondritis involving the femoral condyle or the tibial plateau, weight bearing was absolutely forbidden in less than six weeks. Patients with osteochondritis involving the inferior surface of the patella were allowed weight bearing at the end of three weeks. All patients received the routine courses of physical therapy and in every instance the quadriceps muscle had returned to fifty percent of normal by the time the patient was ready for weight bearing.

Post-Operative Complications

Post-operative complications were for the most part minor and not disabling. There were no post-operative infections and seventeen of the fifty-five patients had a wild effusion into the knee joint which was of no more than two weeks duration. None of them required aspiration. Post-operative pain presented little or no difficulty and no patients required analgesics following the third post-operative day.

Results of Treatment

The criteria for setting up the degree of recovery in these cases was measured from the point of view of knee joint motion, return of quadriceps power and freedom of pain. Those patients in whom there was one-hundred percent return of motion and quadriceps power and who were entirely free of pain were considered excellent. Those in whom the results were considered good, were those in which there was a return of eighty to ninety percent of motion, quadriceps power, and only occasionally slight discomfort in the knee. Those in which motion and quadriceps power had returned to seventy percent and who had pain after considerable exercise were considered fair results, and those who had less than seventy percent quadriceps power, knee motion and varying degrees of pain were considered as poor results. The results in this series were as follows: fourteen patients had excellent results and thirty patients had good results. Thus forty-four patients or 80 percent were discharged to return to full duty within twelve weeks of their admission to the hospital. Of the remaining eleven patients, six were discharged to duty with fair results, three were surveyed to limited duty and two underwent a second arthrotomy because of severe osteochondritis involving the inferior surface of the patella. In these two patients, vitallium patellar caps were applied and the patients eventually surveyed to limited duty.

Summary

Fifty-five cases of traumatic osteochondritis of the knee joint have been presented and a brief discussion of the etiology, clinical findings, pathology, and treatment has been included. Particular emphasis has been placed on the importance of early surgi-

cal intervention in injuries of the knee joint in order to prevent the formation of osteochondritis. Intensive and supervised physical therapy has been pointed up as an important post-operative adjunct to the treatment of osteochondritis and a schedule of physiotherapeutic procedures outlined.

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INTERNSHIP COMPLETED

Official U. S. Navy Photograph

(L to R) Rear Adm. B. W. Hogan, Surg. Gen., Navy, Dr. Paul Dudley White, Dr. Yutaka Katoh, Dr. Noboru Tokumaru, Dr. Yooichiro Yanagita, and Dr. Kooichi Fuji.

On his recent visit to Japan with Rear Admiral Bartholomew W. Hogan, Surgeon General of the Navy, Dr. Paul Dudley White, noted heart specialist of Boston, had occasion to meet and congratulate four Japanese doctors who just completed a year's internship at the U. S. Naval Hospital, Yokosuka, Japan.

Dr. White visited the wards at the Naval Hospital, which is located near Yokohoma, and delivered a lecture to the staff of that hospital.

Career Guidance and Programming for Dental Corps Officers

By

MAJOR GENERAL OSCAR P. SNYDER, DC.,* *U. S. Army*
Chief of Dental Corps

WHEN discussing careers with our dental officers, the question often arises as to what the future holds for them. It is particularly a concern of many of our younger officers whether it is more advantageous to become a Diplomate in a specialty or to continue in the field of general dentistry. We also have a conflict pertaining to the professional versus the administrative aspects of a career. Having served in the Army Dental Corps at a time when there were no dental specialists and all of us were considered qualified and eligible to do dentistry in all of its phases, and now in more recent years having observed the opposite, when we have a substantial number of specialists and fewer and fewer who consider themselves qualified in all phases of dentistry, I feel that the matter should have some discussion, and that it is important for our younger officers especially to give some thought to this subject.

It is not my conviction that a man who has received specialized training, attaining the rating of a Diplomate of a Board, has made himself ineligible for an administrative assignment. Furthermore, I feel that an individual can attain high recognition in a professional field, and at the same time acquire skill and experience as an administrator. It has been my observation that the skilled professional man, if he is actually proficient and successful, must necessarily acquire considerable administrative ability. Unless an individual is endowed with some management qualities, he will be handicapped in performing professional and technical procedures, or functioning in any manner toward instructing and guiding others to any material degree. The individual who is dependent upon others to do all of his managing and administrative work, holding himself aloof from these so-called nonprofessional duties, will find himself handicapped, whether in or out of the military service. We have plenty of examples of professional people in this nation who have contributed to organized professional groups and civic organizations and participated in a very broad pattern of endeavor. It is universally agreed that they are very successful professionally and administratively. We hear it said, with reference to some of those people, "Where and how does he find time to do all of this?" I believe it is because he has gained the ability to manage and plan—which actually is administration. In substantiation of the aforementioned I wish to quote from a chapter by Harold Hillenbrand, Secretary of the American Dental Association, in the very interesting and informative book, *Practice Administration for The Dentist*, recently published by C. V. Mosby and edited by William R. Mann and Kenneth A. Easlick of Ann Arbor: "A professional man need not be a poor businessman, or, conversely, a businessman need not always flee from the ethical standards of a profession. Indeed, there is a considerable literature urging both the professions and industry to learn from each other."

We are occasionally asked how many specialists we need. That is a matter which does not cause me any particular concern, but I do consider that we have every reason to have specialists in a percentage commensurate with average national levels. A greater ratio is perhaps desirable, due to the wide dispersion of our forces and the fact that in so many locations there are no civilian specialists to call upon for consultative or other

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support. I am confident that we need and have a very definite use for many more specialists than we now have in the Dental Corps; I also realize that we could use many more skilled administrators. Therefore, the answer, if any, to all of this is that we must continue to train and develop in every conceivable area and thereby improve our efficiency and increase our scope of endeavor.

In the past, training for our officers has in many instances come to them as a result of their application and personal initiative. I am happy to report that in this office at this time, the data and records on our personnel are such that we have a reasonably good indication as to what their educational requirements may be. This has come to us at times from letters they have written, reports, and internal studies which are constantly being made in order to guide our personnel into a field of endeavor which will be acceptable to them and advantageous to the Army Medical Service.

We are equally as interested and concerned in the career pattern of our civilian component officers as we are of those in the Regular Army. Training is available to these people on a broad specific plan and there is a constant effort to guide the thinking of these people toward training opportunities.

I feel that the younger individual need have no great concern as to the precise pattern he pursues. I do urge and advocate that he approach it with some deliberation and forethought—that first things come first. The basic course for our officers, as offered at the Army Medical Service School, I consider, should be fundamental for every officer entering the service. This prepares the individual for the varied aspects of a military career. I also believe that following this training it is very desirable for the individual to have a period of field service, possibly overseas, but in some location where he has good contact with troops and the functioning of combat units. At this time, the individual supplements his professional and administrative knowledge by functioning with senior officers of all categories. He has also enhanced his skill in general dentistry or possibly acquired a leaning toward one or more specific specialties of his profession. Attendance at professional courses, or further administrative training, may follow the period of troop duty. The plan for these various undertakings is fairly well established, and there is little difficulty in pursuing a pattern which is usually suitable and appropriate. I do not feel that the counselor, or the individual who is being assisted, should expect or aspire too rigidly to a cut and dried program, but that one should launch a program that is logical and feasible, and last but not least, developmental. Observation indicates that in all arms and branches the individual who has pursued a reasonably well planned program seems to reach the higher brackets in his career with a feeling of assurance and confidence. He seldom has the assignment or adjustment problems that some other individual may have who has never bothered to follow any logical plan.

I have prepared these rather brief remarks merely to have all of our people know and realize that we stand ready in the Office of The Surgeon General to do all that is possible to help them in their thinking and planning, realizing full well that this is a two-way matter. Also, due consideration must be given to the fact that we must abide by common sense reasoning and the existing routine directives.

Oral Diagnosis and X-ray: A Method of Teaching Dental Interns in an Army Hospital

By

CAPTAIN NORMAN H. RICKLES, DC, USAR*

THE Section of Oral Diagnosis at a teaching Army Hospital closely approximates the milieu in which the intern will meet new patients in his future military or civilian situation. The purpose of his training in this section is to enable him to see in a short period of time many different kinds of people with varied oral conditions and to adequately diagnose and recommend treatment for their ills. The intern sees many more patients during his six weeks in this section than he did as a dental student or than he would have seen for a long time in private practice. Of the approximately five hundred patients he examines during this time, about fifty need emergency treatment (which he renders, for the most part), four hundred require examination and routine treatment, and fifty are patients posing multiple unique problems.

In the diagnosis and treatment of the emergency patient, constant guidance by the Chief of Section enables the intern to become thoroughly familiar with the signs, symptoms, and tests for the variable etiologic factors comprising a "toothache." He acquires the ability to reassure the patient and to establish rapport quickly. In elucidating the history of the pain, the intern is careful to avoid leading questions; rather, he gives the patients a choice of descriptions of the pain, since they are rarely able to initiate any discriminating remarks themselves. The means for making differential diagnoses among the various afflictions—such as pulp hyperemia, the progressive stages of pulpitis and periapical infection, periodontal infection (particularly acute periodontal abscess), maxillary sinusitis, etc.—are demonstrated, and the interpretations and limitations of these techniques are pointed out. During the diagnostic process the intern is urged to use common sense in the employment of certain testing procedures; e.g., if the patient complains of exquisite pain whenever the teeth in a certain area "come together," it is obvious to the intern that he must percuss the suspicious teeth very gently, or, if hot fluids cause the patient extreme pain which is relieved by cold, the intern has cold water ready to apply instantly to the questionable tooth which may hyper-react to the test application of a hot instrument or gutta-percha.

After making the diagnosis, the intern himself will treat many of the emergency patients under proper supervision. He may extract an unsalvageable tooth, begin root canal therapy on another, perform a pulpotomy on still another, or perhaps merely remove deep caries and place a sedative dressing in a different tooth. Furthermore, he may be called upon to treat an acute periodontal abscess, establish rapport with and treat a child with a toothache, or trim the irritating periphery of a denture.

The emergency patients just mentioned are interspersed among the great bulk of routine patients who merely wish, or must have, their mouths checked and necessary dental work performed. Since most of the latter are hospitalized patients, their charts provide evaluations of systemic conditions; therefore, the oral examination is the only one the intern makes. During this examination, specific oral and exposed surface manifestations of generalized disease are sought for and pointed out in those previously diagnosed cases of conditions such as Addison's Disease, cirrhosis of the liver, Hodgkin's Disease, the leukemias and anemias, renal diseases, and the arthritides. However, in

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the majority of the patients these more or less uncommon conditions are not seen, and a typical examination consists of: (1) An impression of the patient's general health, the appearance of his exposed surfaces, and his reaction to his environment. (2) A thorough intraoral examination including the quality of the breath, the appearance of the inner surfaces of the lips and cheeks, labial and buccal gingivae, palate and faucial areas, tongue, sublingual space, teeth, and the periodontium. The teeth and jaws are examined for dental caries, fistulae, occlusal relations, over- or under-function, faulty contact areas or fillings, food impaction, and the various forms of periodontal disease. If any source of infection is noted, the routine examination of the regional lymph nodes is thereby more accurately directed. The tongue is protruded to examine the dorsum, and then forcibly extended out the right and left sides of the mouth to permit careful visualization of the margins. Finally, it is raised to the palate in order to adequately view the sublingual area. Bimanual palpation is often used in lesions of the tongue, sublingual space, and cheeks, with finger cots whenever a possibly contagious ulceration is being examined.

After this examination, necessary arrangements are made for roentgenograms and/or study models. Finally, all abnormal findings are accurately recorded. The intern and Chief of Section decide what the ideal treatment for the patient would be, followed by the actual plan of treatment in the light of existing personnel and equipment.

It is at this initial visit that the intern attempts to motivate patients with grossly neglected mouths to a desire to attain and maintain good oral health. He often finds it simultaneously discouraging yet challenging to try to change the attitudes of persons who want "all of my teeth pulled out" or whose teeth "don't hold fillings." The intern learns that a surprising number of patients respond gratifyingly to genuine interest in their welfare as individuals.

The morning after the examination both intern and Chief interpret the roentgenograms, thereby clarifying most of the perplexing findings for the intern. Whenever necessary, the patient is reexamined with the x-ray films present. This procedure is particularly valuable in the localization of interproximal caries, cysts, impacted teeth, etc.

Most of the patients seen in the Oral Diagnosis Clinic fall into the routine category just described; however, a small percentage of them do present specific problems. This group may include a patient who requires a full-mouth reconstruction, with the concomitant study models, caries-activity tests, photographs, free-way space determinations, roentgenograms, and the thorough history and examination which are so necessary to a successful end result. The intern is encouraged to perform these diagnostic and planning procedures, even though the military situation may not permit his actual completion of the project. However, each intern usually completes at least one such case during the year.

Another type of patient, usually a dependent, who may prove to be a problem is the one who is scheduled for multiple extractions, but who has no knowledge of her physical status, usually because she hasn't seen a physician for several years. It is pointed out to the intern that an obese middle-aged individual in this category is a definite surgical risk, as are many others, such as dehydrated or anemic patients. At this point the intern's training in the basic sciences is utilized. After a carefully detailed history and examination, he takes the patient's temperature, pulse rate, blood pressure, and respiration rate. He orders certain screening laboratory tests such as the complete blood count, urinalysis, and the tests for bleeding tendencies. Since he is aware of the possible significance of abnormal findings, he refers the patient to the proper medical specialist for further evaluation in the event of their occurrence. Of course, in emergency surgery these detailed procedures are greatly expedited.

Occasionally, a patient with an oral lesion, or one whose active periodontal disease does not respond to local treatment,

constitutes a diagnostic problem. In both these instances intensive case histories and examinations, as well as roentgenographic studies, study models, Kodachrome photographs, and extensive laboratory tests are often found to contribute to the diagnosis. For example, a 32 year old white male continued to suffer from a persistent gingivitis in the upper right posterior area, despite vigorous local therapy. A smear of the area followed by culture and animal inoculation studies disclosed the presence of a highly virulent strain of C. diphtheriae; this organism was eliminated and the gingivitis cleared up after prompt and intensive penicillin therapy. In other instances, such as neoplasms and infectious granulomata, a biopsy proves to be the key to the diagnosis. In the event of unexplained radiolucent areas in the mandible the intern rules out grave conditions such as multiple myeloma, which is reflected in abnormal values for blood calcium, total protein, and globulin; or, a parathyroid adenoma which may be confirmed on the basis of abnormal findings for blood calcium, phosphorus, and phosphatase.

It is important to note that in each of the problems that may arise—reconstruction, oral lesions, pre-surgical evaluation, special periodontal—the chiefs of the other dental sections and members of the medical staff are often consulted by the dental intern for their expert advice.

In addition to the daily examinations of patients, there are special activities which occur periodically, and in which all four interns take part simultaneously. An informal seminar, moderated by the Chief of Section, is held for one hour bi-weekly around a table in a small conference room. Blackboard, projectors, x-ray view boxes, etc., are available for demonstration and discussions of the following subjects: The scope and procedures of Oral Diagnosis, Pain of Dental Origin, Pulpal and Periapical Disease, Periodontal Disease, Foci of Infection, Drugs in Dentistry, Roentgenographic Interpretation, Oral Lesions; Diagnosis and Management, Oral Malignancies, First Aid, and Emergencies which may occur in Dental Practice. Whenever feasible the moderator assumes the role of the problem patient as he enters the dental office. The interns ask him pertinent questions regarding his chief complaint, present illness, past dental and medical histories, family history, etc.—to which the moderator-patient replies in lay language. He then returns to his role of moderator when the interns ask for details of physical, oral, and roentgenographic examinations, and laboratory tests; by supplying the actual findings one after another he continually decreases the list of possible diagnoses, until finally one of the interns correctly names the patient's affliction. After a summary of the pertinent diagnostic criteria in the case, suggestions for treatment are discussed.

Leading specialists from nearby dental schools serve as consultants, devoting several days out of the year to lectures and demonstrations on subjects of their particular interest.

By the end of his stay in the section, the intern should have met certain requirements. First, he must have attained a minimum degree of proficiency in evaluating the patient's oral conditions, together with a reasonable facility for suspecting general or systemic complications. This, in addition to his routine assignments, involves taking at least two cases through a complete work-up, making the principal and lesser diagnoses, followed by a comprehensive treatment plan. He must also demonstrate his capability in the field of Oral Roentgenology by exposing, processing, and interpreting five full-mouth series of x-ray films, five lateral, and five occlusal films.

Parenthetically, it is well to note that different interns accept the newer concepts in Oral Diagnosis, such as screening laboratory tests, with varying degrees of enthusiasm—primarily dependent upon the flexibility of the individual intern, and on his previously developed attitudes.

The author believes that these precise diagnostic and treatment planning procedures involving approximately 500 patients materially augment each dental intern's professional knowledge and capabilities.

Gastric Distention from Ingested Air

By
LOTHAR WIRTH, M.D.

AIR can be swallowed and also sucked into the stomach in a manner comparable to inhalation. While observations concerning aerophagy or air swallowing are well founded, those of sucking air into the stomach are somewhat few and less convincing. Evidence has been presented that air can be sucked through a Wagensteen tube.[1] Under ordinary circumstances, of course, there is no such channel between the stomach and mouth.

The upper part of the esophagus opens its sphincter only during the act of swallowing. Breathing and swallowing, however, cannot be carried out at the very same time. Yet it is apparent that there must be occasions in which the nervous mechanism which controls this musculature fails to operate normally. In cases of sudden distention of the stomach no other mechanism but "air sucking" can explain the tremendous size which the stomach assumes so rapidly. Indirect proof has come from chemical analysis of the suctioned out "gas" in certain cases.[1] Another observation has been used in evidence. As the upper part of the esophagus contains striated muscle it can be brought under voluntary control, at least by some people. In such individuals the opening of this valve has been seen by direct laryngoscopy.[1]

In further support of this concept I would like to report my observations on two men who have learned to control this sphincter to the extent that they can suck into the stomach not only air but unusual amounts of liquids without swallowing. They demonstrated this ability before large gatherings when they consumed a quart of liquid well ahead of their competitors. The downing mechanism was one other than swallowing since there was no movement of the "Adam's apple."

The recognition of this mechanism is important in cases of gastrointestinal distention, particularly in the presence of respiratory disease. Strenuous efforts or fast respiratory movements to satisfy air hunger may lead to tremendous gastric distention through the sucking in of air. As a means of control the use of the suction apparatus is indicated.

82 Broadway
Rensselaer, N.Y.

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[1] Maddock, W. G. Some observations on gastrointestinal distention. The Illinois Medical Journ. 100: 349, Dec. 1951.

AVAILABLE NOW

Mass Casualties—Principles Involved in Treatment. The 190 page reprint of the text material which appeared in the April 1956 issue of MILITARY MEDICINE. $1.50 per copy—Special price for more than ten copies.

EDITORIALS

Our 1956 Convention

THE Expanding Horizons of Military Medicine is the theme for our 1956 Convention which will be held at the Hotel Statler, Washington, D.C., November 12, 13, and 14.

Our president this year, Rear Admiral Winfred P. Dana, predicts a convention of unusual interest. General Chairman Walton P. Jones, Commander in the Medical Corps of the Navy, and Scientific Chairman, Eugene V. Jobe, Captain in the Medical Corps of the Navy, have been very busy with their committee members in developing the entire program for the three day meeting. The Ladies Affairs Committee is headed up by Mrs. George N. Raines of Washington, D.C. Incidentally correspondence for any of these persons can be addressed to the Association offices.

The medical horizon has been expanding rapidly in the past two decades. A portion of that expanding horizon is due to those in the government medical services—the Public Health Service, the Veterans Administration, and the Armed Forces. Each service has its own segment of the arc of that horizon. Our November meeting will deal with those segments and the arc as a whole.

We assure you a profitable three days of instruction seasoned with entertainment and time to visit with your friends also. Plan now to attend the Convention.

Our usual letter will go forward in September. In this we will tell you also about the Ladies events. The October issue of MILITARY MEDICINE will give you the complete program. In the intervening months we shall cover the news of the coming meeting as plans develop.

Tribute to a Passing Era

UNITY of science had been the goal and the leading spirit of the early investigators of truth in the first years of this century. They inherited their ideal from the founders of our modern knowledge that, with its strongest roots, reaches deep down into the nineteenth century. Though, to the contemporaries, knowledge in all historical periods appeared to be complicated, the desire to bring all details together into a simple truth, to have a synthesis of Science, had been the most ardent during the second half of the past century. It was the beginning of the age when titans of thought arose in all fields and in all countries. These ingenious men were indeed *universalists* who, with extraordinary perspicacity, could see correlations in all new inventions and discoveries, and, after having created in themselves a true unity of scientific thought, could apply their panoramic to create monumental and classical works single-handed.

Today, looking over the past hundred years, among the generation of universalists we can recognize not only the highly outstanding creators of science, the Pasteurs and Helmholtzes, the Virchows and Darwins, the Billingses and Welches, the Oslers and Einthovens, the Röntgens and Curies, but also the many lesser figures, the ephemeral imitators of the great who, being *fin-de-siècle* children, still possessed a spark of the genius of the universalists in all realms of human culture, and, with their unusually broad erudition, were able to solve their problems in the practical fields of astronomy, engineering, chemistry, physics, or medicine.

The Era of Universalists reached its peak

about the turn of the century. At the beginning of the First World War, however, there came a rough break in the development of the scientific ideal of unity. Moreover, after its introduction around 1900, a new type of physics began to impress our entire modern scientific thinking. It also prepared the way to the great variety of machines. The chain reaction continued, and the dominance of technique and machines influenced all other human activities. Even our spiritual world gradually changed in size, structure, and meaning. Then, the universalist began to fade away, to be replaced by the specialist; and the extraordinarily gifted single worker became extinct, or he was radically suppressed by the teamworker.

But even now, in 1957, there are still left a few of the old school whose youth was spent in the golden age of universalism, most of them aged men now whose heads are bowed under the burden of years, and whose souls are oppressed by the weight of their experiences, struggles, and disappointments. And the remainder of their world seems to be deeply separated by an unbridgeable abyss from the present cold and frightening radicalism.

George Sarton, historian of science (1884-1956), was also a son of that golden Era of Universalism. Ever since his arrival in the United States (1916), he devoted his life to teaching the importance of tradition in science and to fighting the "technicians and administrators" on the other side of the abyss. With Russell, he saw all knowledge, even the most abstract, as part of the general life of mankind, and as concerned in the endeavour to make human existence less petty, less superstitious, and less miserable. His sudden death on the second day of this Spring is a great loss to his friends and to all humanists.

His tombstone in Boston may also stand as the rock to mark the end of that Passing Era when professional men were groundedly learned in the arts and sciences; when knowledge was integrated *within a man,* and *not between men,* or on the stenographic records of conferences of teamworkers; when there were still learned men who could link the relevant disciplines and could have comprehensive knowledge of contiguous fields. It is a pity that in our jet-propelled age, when knowledge is accumulating in profusion and variety, there is none to assimilate the many scientific data which, therefore, might threaten not only the unity of science in general but also the intellectual unity of such single disciplines as medicine which has been already narrowly disintegrated into exclusive specialties.

Around the World

By
CLAUDIUS F. MAYER, M.D.

XERXES could have hardly imagined that, some 2,500 years later, his country would become the international laboratory for the testing of antirabies serum. This happened because the World Health Organization started to worry in recent years about the fact that treatment by antirabies vaccine to prevent the fatal outcome of this virus infection was often powerless on patients who were bitten in the head by the rabid animal. Since 1950 this problem has been in the hand of an expert committee of WHO. The Committee recommended the study of a *hyperimmune serum for the control of rabies.* For the *field trials, Iran* was chosen where rabid wolves used to attack villagers quite frequently; between 1936 and 1949 more than 300 persons had been bitten. A dramatic situation developed in August 1954 when one night 29 persons at the village of Sahané were injured by a single rabid wolf. The therapeutic tests at the Teheran Pasteur Institute, where the victims were sent by truck, show that, in the case of head bites, the combination of hyperimmune serum therapy and vaccination—i.e., passive and active immunization together—is the best method of treatment. The passive antibodies of the therapeutic serum are sufficient to hold the inoculated rabies virus in check until about the third week after the bite when, as the result of vaccinations, active antibodies will be ready to take over the defense of the organism.

Malnutrition is the greatest problem of at least four fifths of the world population. The nutritional situation is not better *in Iraq.* The newborn in Baghdad are below the expected weight of such infants. The growth of school children is typically retarded. In the village of Sulemanya, e.g., 90% of the children were less than 132.8 cm (4 ft. 4 in.) tall, while in French children of the same age group only 10% were so stunted. While a group of French children only 10% was found to weigh less than 62 lb., in a similar group of Iraq children 81% were found to be below that standard weight. People of that country are aging precociously, and they gray early, showing many signs of clinical avitaminosis and lack of nitrogen. The action of intestinal and other parasites is also evident. In Iraq there are very few old people. The vital capacity of at least 80% of the population could be improved by proper nutrition in Mesopotamia.

Iraq itself tries to mobilize its own forces against this basic food problem, and called for aid at the UN Food and Agriculture Organization (FAO). It created a Committee on Nutrition whose members are chosen from all national agencies interested in food and nutrition. The government also launched a vast educational program by means of radio, press, and school. The school children started to receive free milk and cod-liver oil capsules at the schools. A training school for dietitians will soon be established. The *Nutritional Institute of Iraq* is headed by a physician. The institute is divided into three sections: a) internal, where 24 beds are available for hospitalization and clinical studies, b) external, for nutritional surveys, and c) a laboratory for both departments, for food analysis and human biochemical studies.

Revision of a sample of the 1930 class of *recruiting of 18-year old Mexicans* recently showed various interesting facts about the physical fitness of young people who form the basic pool of national defense of that country. Nine military regions include 33 military zones in Mexico, and one year's contigenent amounted to 3,396 persons. Of this group, 75.2% were found fit for general military service, 2.5% for limited service, and 22.3% were unfit for service. In certain districts, as in Chihuahua, 52.5%

of the draftees showed defects, while in other districts they were all able-bodied. The chief causes of limited service were refractive errors (32.9), respiratory disorders (17.6%), cardiovascular ailments (10.7%). Seven hundred and fifty eight persons were rejected for such reasons as constitutional defects (60.3%), cardiovascular defects (5.3%), diseases of the locomotor system (4.7%), fatigue (3.5%), and eye diseases (3.4%).

The recruiting statistics of Mexico reflect the general *physical condition in the Latin American states* where, inspite of their seemingly healthy exterior, about 80% of the population are ill-fed. Their chronic hunger results in gradual deterioration of their physical, moral and intellectual faculties, which is then erroneously interpreted by the outsiders as a racial characteristic (apathy, indolence, laziness, etc.). In *Mexico, the problem of malnutrition* is being investigated by the National Institute of Nutrition and the Office of National Campaign against Endemic Goiter. A professor at the Mexican Military Medical School recently emphasized that the real basis of malnutrition of the Mexican and Latin American people is mistreatment of the soil, economic poverty, and ignorance.

He would like us to believe that these countries indeed abound in food of high-calorie value, rich in protein and vitamins. This statement is perhaps too general, though. A survey of the economic and social conditions and *diet of the workers on Guatemalan sugar plantations,* for instance, showed a very deplorable picture. The socio-economic conditions are very low, and the daily food is deficient in animal protein, vitamin A, riboflavin, and vitamin C. The workers therefore suffer from dry skin, follicular hyperkeratosis, caries of teeth, goiter, anemia, and malaria.

Survey and treatment of *tuberculosis in the Cuban Army* is proceeding according to the most modern methods. Recently issued data of the 1948-49 survey showed that only 0.74% of the troops were affected by active tuberculosis. Further clinical experiences proved that the real danger of tuberculosis is not in the Army itself but in the dependents of the soldiers.

Switzerland holds the record in Nobel-Prize winners when the award and the population of various countries are compared. Switzerland has 4,700,000 inhabitants, yet it produced five élite scientists:—Theodor Kocher, awarded in 1909 for thyroid surgery; Paul Karrer, awarded in 1937 for his studies on carotenoids, flavines, vitamin A and B_2; Paul Herman Müller, awarded in 1948 for the invention of DDT; Walter Rudolf Hess, awarded in 1949 for his studies of the diencephalon; and Thaddeus Reichstein, awarded in 1950, for his discovery of the adrenal cortex hormone.—The Swiss Federal Council feels that *military surgery* should be *a regular obligatory course* in the curriculum of every physician. Such a training would be, indeed, a great aid in case of a total war.

Observations at the Orthopedic Hospital of *Finland's Foundation for the Disabled* show that hypnosis may be of some value in the *treatment of phantom sensations.* In 35% of the treated amputees, positive good results were obtained. It remains a question how long the freedom from phantom pain will last. Apparently, an amputation cuts off the physical portion of the body, but it does not amputate the "body scheme." The conception of one's own body and limbs is left unchanged by the surgical severance of a limb, and the patient feels as if the amputated part would still be there. Psychotherapy has been tried since 1926 in a very limited number of cases.

Isny is a village in Allgäu, in Southwestern Bavaria. It is surrounded by the beautiful Bavarian Alps. The *Deutscher Versehrtensport,* a cooperative "Arbeitsgemeinschaft," together with the Labor Ministry of the German Federal Republic, selected this place for the location of a sanatorium, *a sport sanatorium where disabled veterans* and others, including the blind, are apt to find help for body and soul. The "co-op" has been in existence since 1951. It holds annual meetings at Isny, usually con-

nected with curative exercises, games, and various types of sport.

Another type of home was created at Wupperthal in the Rhineland. It is in a quiet village. The home was founded by the elderly wife of a German clergyman. It is called *The Albert Schweitzer Home.* There Frau Dilloo keeps 18 out of the 3,600 *colored illegitimate children* who were left fatherless by the occupation forces. Officials of the Liberian Government recently expressed interest in accepting some of the children as immigrants to their African country.

"Surgical antenna" is the name of a light surgical team which became a new organizational unit most suitable for the particular type of combat that was developed by the French Union forces in the *Indochina Theater of Operations.* The antenna is the smallest autonomous surgical unit capable of functioning for the treatment of the wounded. It answers the desire to bring the surgeon as close to the battlefield as possible. The surgical antenna is a front unit, often cut off from the rear. Its tasks are: 1) first aid, after the preliminary aid received at a battalion station, 2) prevention of infections, especially of tetanus, 3) prevention of shock, 4) emergency surgery, 5) surgical triage.

The surgical *antenna is of two types,* mobile and parachutist. The team of each is composed of a young surgeon, two nurses (one for anesthesia), one non-commissioned officer, one sterilizing technician, and five medical soldiers. Members of the parachute units are men only. One unit is capable of treating 100 wounded, or of caring for 20 hospital patients. The leading idea of the unit is that the surgeon should go to the wounded, if it cannot be done the other way around.

A *mysterious congestive heart-failure* seems to be of high frequency in Africans. A medical officer, of the Kitchener School of Medicine in Khartum *in the Sudan,* observed several cases and lately had also the opportunity to study some of them by necropsy. It was surprising to him that all hearts presented *endomyocardial fibrosis.* He could not find any apparent cause for this affection. While further research is desirable, it may be recalled that such cases had been also observed in 1946 in Africans serving in the Middle East.

The arrival of hot weather reminds us of the belief that Africans are better equipped for the tolerance of environmental heat than are Europeans with white skin. Recent anatomical and plastic-impression pore counts showed, however, that there is *no racial difference in the number of sweat glands in the skin.* The average numbers per cm^2 of skin were: 1) hand and forehead, 238; 2) foot, 183; 3) arm and forearm, 113; 4) abdomen, scapula, lumbar region, thigh, chest, and leg, 88. Nevertheless, there are great functional differences. Africans are sweating less (181 grams/m^2/hour) than Europeans (298 gm/m^2/h); Africans rectal temperature is lower (100.2°F) than that of the white people (100.65°F); and their skin is hotter (97.32°F) than the white skin (96.62°F). Hence, Africans appear to have a *better mechanism for the dissipation of heat* (?).

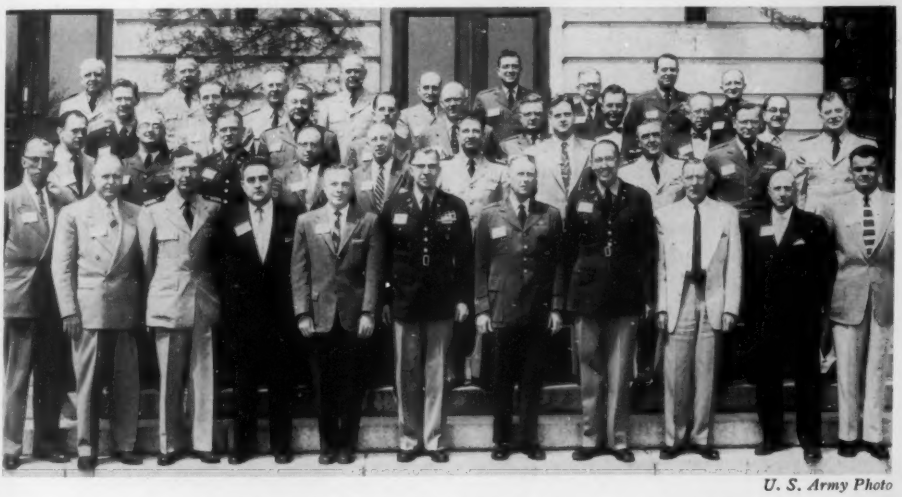
A surgeon of the Sakbayeme Hospital of the American Presbyterian Mission in *French Cameroons found that peptic ulcers are quite frequent* among the Basa people. From 1950 to July 1955, he surgically confirmed 319 cases of peptic ulcer. They were chiefly duodenal (309), rarely gastric (8 of them malignant), Medical treatment was of no avail. Though Africans have a greater incidence of achlorhydria than Caucasians, they have also a wider range of gastric acidity. Even among Africans, the cause of peptic ulcer is chiefly psychosomatic. Fear and frustration dominate them. They fear not only the spirit worlds but also each other; their contact with white civilization brought them more frustration in attempts to imitate. Africans do not trust each other—usually with good reasons. Moreover, the Basa people are especially quarrelsome, and they are entangled in nationalistic movements, all the more reasons to have duodenal ulcers.

Baron Münchhausen is haunting again. There was *a peculiar syndrome* described a few years ago in European medical journals in which, aside from the incurability of the

condition, the chief characteristic was the patient's invincible drive to migrate from hospital to hospital. European colleagues are well acquainted with a certain young patient, who some time or other had visited almost all English, Irish and French hospitals as a patient. The odd feature of his case is that he lets himself be picked up in a dazed condition, collapsed near a hospital, with bleeding from some site. When he comes out of his unconsciousness he usually tells that he was on his way to a monastery. A London doctor wishes to recognize three varieties of the Münchhausen syndrome: 1) abdominal type (*laparotomophilia migrans*). 2) the bleeding type (*hemorrhagia histrionica*) 3) and the specialization in fits, palsies, etc. (*neurologia diabolica*). All these particular types of the malingerer are usually intriguing personalities. For this feature alone they might be justly rewarded with a medical eponym of their own.

A member of the British Parliament requested the Postmaster-General to consider setting up a system whereby, in case of emergency, the public could get into touch at once with a doctor by *dialing DOC,* or some similar easy code! . . . *Multa paucis!*

TWELFTH INTERAGENCY INSTITUTE



U. S. Army Photo

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Honorary Membership

U. S. Army Photo

MED. GEN. INSP. ALFRED J. REILINGER

THE Association of Military Surgeons of the United States had the great pleasure of conferring honorary membership on the distinguished Médecin Général Inspecteur Alfred J. Reilinger, Directeur des Services de Santé de Armées de France, on April 19, 1956.

General Reilinger arrived in the United States the early part of April for the purpose of visiting medical installations, chiefly military, in this country. During his visits he was accompanied by Lt. Colonel Frank J. Vita of the Army Medical Corps who just recently completed a tour of duty in Paris.

A dinner on the evening of April 19 was given at the Walter Reed Army Medical Center by Major General Silas B. Hayes, Surgeon General of the Army, to honor General Reilinger. Distinguished guests at the dinner included the President's physician, Major General Howard Mc. Snyder; the Commanding General of the Walter Reed Army Medical Center, Major General Leonard D. Heaton; and the Deputy Surgeon General of the Army, Major General James P. Cooney.

Following the dinner General Reilinger presented a talk at Sternberg Auditorium on a "Glimpse into the History of the French Military Medical Service." His talk was accompanied by beautiful colored slides of historical paintings.

After the talk General Cooney, acting as Master of Ceremonies, presented to General Reilinger, the Badge of the Association, the Certificate of Honorary Membership, and the *History of the Association of Military Surgeons of the United States, 1891-1941*. The Badge was pinned on by "another distinguished military surgeon," General Snyder.

SUSTAINING MEMBERS

It is a privilege to list the firms who have joined The Association of Military Surgeons as Sustaining Members. We gratefully acknowledge their support.

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ASSOCIATION NOTES

Timely items of general interest are accepted for these columns. Deadline is 3rd of month preceding month of issue.

Department of Defense

Ass't Secretary (Health & Medical)—HON. FRANK B. BERRY, M.D.

Deputy Ass't Sec'y.—HON. EDW. H. CUSHING, M.D.

PL 497

The Medical Career Incentives Bill (HR 9428) was signed by President Eisenhower on April 30 to be effective May 1. Known as Public Law 497, 84th Congress it will give physicians and dentists of the Armed Forces an increase in monthly pay depending upon the length of service.

Those having less than two full years of service will be given $100 a month extra which is the amount they have already been given; those with two full years of service will receive $150 a month until they have completed six full years, when they will go into the $200 a month bracket until they have completed ten years of service. At that time they will receive $250 a month extra.

There is also an adjustment for longevity, physicians receiving credit for five years, and dentists receiving credit for four years.

ARMED FORCES STRENGTH

The strength of the Armed Forces as of February 29 was 2,863,783: Army 1,060,516; Navy 669,707; Marine Corps 199,760; Air Force 933,800.

RADIOLOGICAL HEALTH COURSE

The thirteenth class in veterinary radiological health got under way on June 4 at Oak Ridge Institute for Nuclear Studies, Oak Ridge, Tenn.

The courses are presented by the Special Training Division of the Institute in cooperation with the University of Tennessee-Atomic Energy Commission Agricultural Research Program. They are designed to provide indoctrination in health physics, a relatively new field of scientific endeavor concerned with the prevention of damage to life or property from radiation.

Dr. Ralph T. Overman is Director of the Institute. Instructors are Lt. Col. Walter T. Carll; Lt. Col. Bernard F. Trum; and Majors M. Nold and U. S. Grant Kuhn.

OPHTHALMIC PATHOLOGY

At the recent course in Ophthalmic Pathology held at the Armed Forces Institute of Pathology there were four foreign physicians representing the countries of Canada, Iran, Pakistan, and the Philippines. There were 28 from the United States representing the Army, Navy, Air Force, Public Health Service, and the Veterans Administration.

Dr. Lorenz E. Zimmerman, the Course Director, announced that the tentative date for the next Course will be March 25-29, 1957. Applications will not be accepted until November.

HALLORAN HOSPITAL FLAG

Captain William M. Silliphant, MC, U. S. Navy, Director of the Armed Forces Institute of Pathology, and Colonel Hugh R. Gilmore, Jr., MC, U. S. Army, Curator of the Medical Museum, recently accepted the organizational flag of the Halloran General Hospital which was presented to the Armed Forces Medical Museum.

The donor of the flag was Miss Ann Halloran, sister of the late Colonel Paul S.

Halloran of the Army Medical Corps for whom the hospital was named. The hospital was the famed wartime paraplegic center at Staten Island, New York.

Army

Surgeon General—MAJ. GEN. SILAS B. HAYS

Deputy Surg. Gen.—MAJ. GEN. JAMES P. COONEY

PREVENTIVE MEDICINE OFFICERS NEEDED

The Surgeon General has made the need for preventive medicine officers in the Army known. In order to fill that need selected officers are being chosen for careers in preventive medicine.

To a limited number of young officers a total of six years' training and experience program will be offered to fulfill the requirements for examination by the American Board of Preventive Medicine.

At the present time applications are accepted for the Military Preventive Medicine Course at the Walter Reed Army Institute of Research. Applications should be sent to the Surgeon General.

ASSIGNMENT SGO

Lt. Col. Floyd L. Berry, MSC, has been appointed Chief, Sanitary Engineering Section, Medical Service Corps, in the Office of the Surgeon General.

This is an additional assignment to that which he has been filling in the Preventive Medicine Division. The new duty will pertain to administrative matters and policy recommendations having to do with personnel.

Lt. Colonel R. L. Parker, MSC, has been appointed executive officer in the Supply Division in the Office of the Surgeon General. He replaces Colonel Bernard Kotte who has been assigned to the Brooke Army Medical Center.

ADDRESSES INTERNATIONAL DENTAL MEETING

Maj. Gen. Oscar P. Snyder, Chief of the Army Dental Corps, addressed the Federation Dentaire Internationale convention at Zurich, Switzerland, on May 30 on the subject: "The Task of the Dental Office in Wartime."

GENERAL HEATON HONORED

Membership in the American Surgical Association is the honor bestowed on Maj. General Leonard D. Heaton, Commanding General of the Walter Reed Army Medical Center. He is the third member of the Regular Army Medical Corps who has been so honored by this distinguished surgical association. The others were Colonel William L. Keller and Maj. General Norman T. Kirk, both retired.

CHIEFS AMSC HONORED

Portraits of Colonel Emma E. Vogel, retired, first Chief of the Army Medical Specialist Corps, and Colonel Nell Wickliffe Merrill, retired, the second Chief, were presented at the ninth anniversary of the Corps celebrated at Delano Hall, Walter Reed Army Medical Center, April 16.

Both Colonel Vogel and Colonel Wickliffe Merrill were present as was also Colonel Harriet S. Lee the present Chief.

These portraits will be placed in the Walter Reed Army Institute of Research at the Center.

DENTAL LAB CHIEF

Colonel Marion L. Mills, DC, has assumed the position of Commanding Officer of the Central Dental Laboratory at the Walter Reed Army Medical Center.

Q FEVER THERAPY

Terramycin given *late in the incubation period* will prevent Q fever according to Col. William D. Tigertt, MC, Chief of the Special Operations Branch, and Lt. Col. Abram S. Beneson, MC, Director of Immunology, both of the Walter Reed Army Institute of Research. This disclosure was made at the recent meeting of the Association of American Physicians at Atlantic City.

The antibiotic was given to a group of

young soldiers of the Seventh-day Adventist faith who had volunteered their services for the research project.

The disease has an incubation period of 17 days and as pointed out by Col. Tigertt the antibiotic should be given late in that period. If given soon after exposure terramycin did not prevent the disease but delayed the time of onset. It was also stated that if the antibiotic is given within 24 hours after the onset of fever the symptoms subsided within two days.

SIMMONS MEMORIAL LECTURE

The second Simmons Memorial Lecture was given at the Sternberg Auditorium, Walter Reed Army Medical Center on May 24 by Ross A. McFarland, Ph.D., Associate Professor of Industrial Hygiene, Harvard School of Public Health, and Director of the Armed Forces Epidemiological Board Commission on Accidental Trauma. His topic was "The Role of Human Factors in Accidental Trauma."

The late Brig. Gen. James Stevens Simmons retired July 1, 1946 after 30 years of service in the Army Medical Corps. At the time of his death on July 31, 1954 he was dean and professor at the Harvard School of Public Health. During his Army service he became Chief of the Preventive Medicine Service (now the Preventive Medicine Division) of the Office of the Surgeon General.

LIVER REGENERATION

Dr. Andre D. Glinos of the Walter Reed Army Institute of Research has shown that damaged liver tissue is regenerated through a blood dilution process. This seems to occur due to the decrease of a growth-inhibiting substance circulating in the blood. He is now attempting to identify that substance.

Now what is the clinical significance of this work? First, it is an understanding of the control of tissue regeneration which will have a direct bearing on the treatment of all cases where tissue repair is involved, such as wound injuries, infections, and radiation injuries; and second, it will help pin-point the basic change in the cancer cell which renders it independent of control by the body.

QUALIFICATIONS FOR HOSPITAL EXECUTIVES

Col. Byron L. Steger, Chief of the Education and Training Division of the Office of the Surgeon General recently spoke on the subject "Training the Federal Hospital Executive" at the Southeastern Hospital Conference in Miami. He stressed executive development and human relations in hospital executives. The patient must be considered the "keystone" in future training according to Col. Steger.

TO NFIP

Major Edith A. Aynes, ANC, has retired from the Army and has taken the position as Coordinator of Professional Education Program Information of the National Foundation for Infantile Paralysis, 120 Broadway, New York 5, N.Y.

Major Aynes' last station was at the Army Medical Service School, Fort Sam Houston, Texas, where she was Instructor in the Nursing Service Administration. She has had broad experience in public relations and communications which will greatly benefit her in her new position.

FLUORIDATION OF WATER

The Surgeon General of the Army has approved 21 Army posts in the United States, Alaska, Hawaii, and Puerto Rico for fluoridation of drinking water since the program has been inaugurated in July 1954.

The program is a joint one requiring the approval of the Surgeon General of the Army and the Chief of the Army Corps of Engineers.

Maj. Gen. Oscar P. Snyder, Chief of the Army Dental Corps, cited the opinion of the Committee on Dentistry of the National Research Council made in the fall of 1953 when the views of that Committee were sought. The statement issued was: "The Committee on Dentistry believes that there is sufficient scientific evidence of the merits of fluoridation of public water supply to justify its use on military posts whenever feasible and es-

pecially where there is a child population in residence."

AVIATION MEDICAL OFFICERS

Opportunities in the Army exist in the field of aviation medicine for qualified Army Medical Officers, Regular or Reserve, in the grade of lieutenant to lieutenant colonel.

Quotas have been arranged for initial training in the Schools of Aviation Medicine of the Air Force and Navy.

Applicants should refer to DA Circular 261-17, Feb. 28, 1956. The applications must be sent through channels to the Surgeon General of the Army and must contain the following information: Report of Medical Examination (Form 88); statement of desire to participate in operational aerial flights; confirmation of retainability in service; course desired (Army or Navy) and the starting date desired.

SPECIALISTS IN RESERVE

Draft eligible men who are skilled in a medical specialty may qualify for the special Army Reserve program. These individuals may fulfill their active service obligation by performing six months of active duty. After that time they will be free of any further military training demands so long as they remain engaged or employed in critical civilian occupations which are peculiar to the Army Medical Service. Selection of the individuals is made by Selective Service.

The new program is said to be of particular interest to hospitals and allied medical activities as careers in those fields may be pursued with a minimum of interruption due to military service.

The occupations mentioned are veterinary medicine, pharmacy, physiology, plant pathology, biochemistry, chemistry, entomology, parasitology, nursing, physical therapy, occupational therapy, dentistry, bacteriology, psychology, and psychiatric social work.

RETIRED

Col. Reuel E. Hewitt, former Sixth Army Surgeon, has retired and taken up residency at Auburn, Calif., (P. O. Box 192).

Navy

Surgeon General—Rear Adm. Bartholomew W. Hogan

Deputy Surgeon General—Rear Admiral Bruce E. Bradley

RADIOISOTOPE LAB IN EGYPT

The Surgeon General of the Navy recently announced that a complete Radioisotope Laboratory had been established in the Egyptian National Research Council Building at Cairo, Egypt.

The laboratory was completely preassembled and placed into operation at the National Naval Medical Center, Bethesda, Md., before being moved to Cairo. United States trained Egyptian scientists staff the laboratory.

Under the terms of the "Atoms for Peace Program" and a three year agreement with the Egyptian Government more than 15 Egyptian scientists will be trained at the National Naval Medical Center and at various other laboratories in the United States for duty at the Cairo laboratory.

IDENTIFICATION OF DECEASED

Dental records have proven extremely valuable in the identification of casualty victims. An item was carried in our April issue in which identification of victims of the Marine Corps plane that crashed in California was made through dental records. Now we learn of a case in which identification was made from the remains of a mandible and fragments of a maxilla because of the accurate recording of two Dental Corps officers of the Navy, Captains Leo E. Brenning and Frank D. Dobyns.

The time may come when there will be a central dental records office as well as a central finger print office.

CLERKSHIP PROGRAM

A Research Clerkship Training Program has been inaugurated by the Navy which will give the trainee up to 60 days active duty at Naval Medical Research Activities. The program is available to medical students

commissioned as Ensigns, 1955, U. S. Naval Reserve who have successfully completed their first year of medical school.

In addition to providing employment for the summer months the trainee will participate in some research program which is under way at the installation to which he is ordered. Full pay and allowances are given for the time spent which may include up to sixty days.

DENTAL RESERVE OFFICERS

Acceptance of applications for direct appointment in the Dental Corps, Naval Reserve, for active duty is suspended except for those dentists completing dental school during calendar year 1956 who have been allocated to the Department of the Navy under terms of the Armed Forces Reserve Dental Officer Commissioning Program.

If those senior dental students allocated to the Department of the Navy fail to submit applications for active duty within four months after date of graduation, they will not be accepted for active duty.

Applications may continue to be accepted and processed for inactive duty for women and priority 4 dentists. It is not anticipated that an active duty request from applicants in these categories could be favorably considered during the fiscal year 1957.

RETIRED

Capt. Thomas Ferwerda, MC, USN, has retired from the Navy and accepted a position as Clinical Director, Austin State School for Handicapped Children, Austin, Texas.

Lt. Robert W. Kentner, MSC, USN, has retired and has taken up his residency at 3611 Isbell St., Silver Spring, Md.

Captain Julian Love, MC, Commanding Officer of the Naval Hospital at Corona, Calif., will retire July 1. He will make his home at 1669 Elevado Ave., Arcadia, Calif.

Air Force

Surgeon General—MAJ. GEN. DAN C. OGLE
Deputy Surg. Gen.—MAJ. GEN. W. H. POWELL, JR.

AVIATION MEDICINE

At a recent graduation of 90 medical officers of the Air Force, Army, and nine other nations at the School of Aviation Medicine, Randolph Air Force Base, Texas, Col. John R. McGraw, Acting Commandant, said, "The 16 graduates from abroad in this one class come to more than the entire list of those who attended the School in its first 23 years. Up to the start of World War II we had graduated only 13 surgeons of other lands, and four of these were from the Philippines, at that time a possession of the United States.

"In the decade since the War, we have extended our roster of graduates in other countries to 209."

Foreign graduates in the class included four surgeons of Japan's air force, Lt. Cols. Shigeyoshi Yamamoto and Takashi Yamazaki and Capts. Sakae Enjyoji and Haruhiko Ito; two from Yugoslavia, Lt. Col. Mihailo Funtek and Maj. Stanko Plevnik; one from Great Britain, Wing Cdr. Ronald J. A. Morris; Capt. Sadab Dhiraputra and Flying Officer Charu Sanguan Bhokai of Thailand; Maj. Mohammad M. Ali of Pakistan; Lts. Charilaos G. Giannopoulos and George S. Raptis of Greece; Capt. Raul Maldonado of Ecuador; Capt. Humberto Suarez of Nicaragua; Lts. Rodrigo Barrenceche S. and Alvaro Cogollos of Colombia.

SAMA DEVELOPED

A Serum Agar Measuring Aid, SAMA for short, has been developed by William G. Glenn and Heinz A. Jaeger of the School of Aviation Medicine, Randolph Air Force Base, Texas.

This device is used to determine the density and diffusion of serum components. It is attached to a photoelectric measuring instrument to provide the researcher with an accurate quantitative analysis of the antibodies or antigens in blood cultures. Many hours of a laboratory technician's time will be saved by the device.

SOLAR FURNACE

Concentration of the sun's energy on a

single spot by the use of mirrors may bring a temperature of 7000° to 8000°. This solar furnace will be constructed by the Air Force at a 9000 foot elevation in the Sacramento Mountains near Holloman Air Development Center, Alamogordo, New Mexico. When completed the furnace will be operated by the Air Force for the use of the Armed Forces.

HOSPITAL ADMINISTRATION TRAINEES

Twenty Medical Service Corps officers have been selected for graduate level training in hospital administration to begin in September 1956. Fifteen will attend the course at Brooke Army Medical Center (affiliated with Baylor University) and five will attend civilian institutions.

Those selected are: Majors Harrison G. Burnie, Robert L. English, Robert W. Hobson, Robert L. Holliday, Guy C. Nicholson, and Joseph H. Wallace; Captains Bernard F. Bauman, Donald E. Callaghan, Ivan B. Grimes, Gordon F. Loebig, Charles J. Werderman, and LeRoy D. Werley; First Lieutenants Clyde L. Britt, James M. Crews, Frederick J. Diedrich, Jr., John Frezza, Neil B. Hadley, Halbert J. Hooper, Chalmers F. Kerschmer, and Kenneth W. Peters.

PSYCHOLOGIST HONORED

Dr. Saul B. Sells, head of the Department of Clinical Psychology, School of Aviation Medicine, Randolph Air Force Base, Texas, was awarded the Raymond F. Longacre Award of the Aero Medical Association at its meeting in Chicago in April.

The Award went to Dr. Sells for his research work in developing personality tests that will reflect the character and psychic background of an applicant for flight training. The tests are expected to weed out the comparative few who—despite aptitude, intelligence, and the desire to fly—might be expected to fail at a crucial moment in combat.

ELECTED TO SIGMA XI

Col. Harry A. Gorman, USAF (VC), was recently honored by election to membership in the national scientific research society of Sigma Xi. He has been registered in the Graduate School of Ohio State University for the past three years and in addition has been serving as Professor of Military Science and Tactics at the University.

Colonel Gorman has been reassigned as Director of the Veterinary Research Division, Air Force School of Aviation Medicine.

Public Health Service

Surgeon General—LEONARD A. SCHEELE, M.D.

Deputy Surg. Gen.—W. PALMER DEERING, M.D.

PL 492

President Eisenhower signed S 2587 on April 30. Now known as Public Law 492, 84th Congress, provisions are made for the active service of the Commissioned Corps of the Public Health Service in time of national emergency. Other provisions are also made in the law for this commissioned group in times of national crises.

ASSIGNMENT NIH

Dr. Joseph E. Smadel who was previously Director of the Division of Communicable Diseases and Chief of the Department of Virus and Rickettsial Diseases, Walter Reed Army Institute of Research, has assumed the post of Associate Director of the National Institutes of Health, Bethesda, Md.

In that position he is responsible for coordination of the laboratory and clinical investigation programs conducted by the seven medical research institutes which make up the National Institutes of Health.

RESERVE COMPONENT

In its increasing program to enlarge its commissioned officer corps there were recently appointed 101 physicians, nurses, sanitary engineers, and pharmacists to the inactive reserve component of the United States Public Health Service.

As pointed out previously these officers

are called to active duty to augment the staffs of official State and local health agencies and to augment the Public Health Service operating staffs in major emergencies affecting the health and well-being of large numbers of people.

LABORATORY REFRESHER COURSES

The following courses will be given at the Communicable Disease Center, Public Health Service, Chamblee, Georgia.

Dates	Course No.	Courses	Duration	Location*
1956				
Sept. 10-21	8.40	Laboratory Methods in the Diagnosis of Bacterial Diseases Part 1. General Bacteriology	2 wks.	2
Sept. 10-Oct. 5	8.00	Laboratory Methods in the Diagnosis of Parasitic Diseases Part 1. Intestinal Parasites	4 wks.	1
Sept. 24-Oct. 5	8.41	Laboratory Methods in the Diagnosis of Bacterial Diseases Part 2. General Bacteriology	2 wks.	2
Oct. 8-19	8.50	Laboratory Methods in the Diagnosis of Bacterial Diseases, Enteric Bacteriology	2 wks.	2
Oct. 8-26	8.01	Laboratory Methods in the Diagnosis of Parasitic Diseases Part 2. Blood Parasites	3 wks.	1
Oct. 15-26	8.20	Laboratory Methods in the Diagnosis of Viral and Rickettsial Diseases	2 wks.	3
Oct. 29-Nov. 2	8.26	Laboratory Methods in the Diagnosis of Rabies	1 wk.	3
1957				
Jan. 7-18	8.15	Laboratory Methods in Medical Mycology Part 1. Cutaneous Pathogenic Fungi	2 wks.	1
Jan. 21-Feb. 1	8.16	Laboratory Methods in Medical Mycology Part 2. Subcutaneous & Systemic Fungi**	2 wks.	1
Jan. 21-Feb. 1	8.55	Laboratory Methods in the Diagnosis of Tuberculosis	2 wks.	2
Feb. 4-15	8.17	Laboratory Methods in the Study of Pulmonary Mycoses	2 wks.	1
Feb. 25-Mar. 1	9.40	Laboratory Diagnostic Methods in Veterinary Mycology	1 wk.	1
Mar. 11-22	8.20	Laboratory Methods in the Diagnosis of Viral and Rickettsial Diseases	2 wks.	3
Mar. 11-22	9.41	Serologic Methods in the Diagnosis of Parasitic and Mycotic Infections	2 wks.	1
Mar. 25-29	8.26	Laboratory Methods in Diagnosis of Rabies	1 wk.	3
##	8.05	Laboratory Methods in Diagnosis of Malaria	2 wks.	1
##	8.21	Virus Isolation and Identification Techniques	2-4 wks.	3
##	8.42	Typing of Corynebacterium diphtheriae	1 wk.	2
##	8.51	Special Problems in Enteric Bacteriology	2 wks.	2
##	8.52	Phage Typing of Salmonella typhosa	1 wk.	2
##	8.53	Laboratory Methods in Diagnosis of Leptospirosis	1-4 wks.	2
##	8.54	Serologic Differentiation of Streptococci	2 wks.	2

* Location of Classrooms: 1 Bldg. 27, Chamblee, Ga.; 2 Bldg. 30, Chamblee, Ga.; 3 Virus Laboratory, Montgomery, Ala.

** Completion of Course 8.15 or equivalent education or experience is a prerequisite.

Courses given by special arrangement only.

For further information address Communicable Disease Center, Laboratory Branch, P.O. Box 185, Chamblee, Ga.

SEROLOGY COURSES

Laboratory refresher courses covering aspects of syphilis will be given at the Venereal Disease Research Laboratory in Chamblee, Georgia, on the following dates:

Serology of Syphilis—Aug. 20-31, 1956.

Serology of Syphilis—Sept. 17-28, 1956.

Management and Control of Syphilis Serology by the Regional Laboratory—Oct. 8-19, 1956.

Tests for Syphilis Using the Treponema

Pallidum—Oct. 22-Nov. 2, 1956.

Serology of Syphilis—Dec. 3-14, 1956.

Serology of Syphilis—Feb. 4-15, 1957.

Serology of Syphilis—Mar. 18-29, 1957.

Tests for Syphilis Using the Treponema Pallidum—Apr. 8-19, 1957.

Management and Control of Syphilis Serology by the Regional Laboratory—Apr. 22-May 3, 1957.

These refresher courses are designed to provide training to senior operating personnel of State and Public Health Service laboratories and to other qualified individuals from this and other countries.

Correspondence pertaining to these courses should be addressed to: Director, Venereal Disease Research Laboratory, Division of Special Health Services, PHS, P.O. Box 185, Chamblee, Ga.

NEUROLOGICAL TRAINING

Special Clinical Traineeships in the fields of neurological and sensory disorders have been established at the National Institute of Neurological Diseases and Blindness of the National Institutes of Health, Bethesda, Md.

These traineeships are open to those physicians who have completed residency training or its equivalent in a medical specialty and desire further training for careers as clinical investigators and educators.

Further information may be obtained from the Chief, Extramural Programs, at the above Institute.

RESEARCH GRANT APPLICATIONS

The Public Health Service has announced a new procedure to expedite the processing of research grant applications for those requests which do not exceed $2000 plus indirect costs and which do not ask support for more than one year. Such applications will be accepted and processed on receipt and are not therefore subject to the usual deadlines for submission prior to review.

Council recommendations can be expected on these applications within 1 to 4 months from the time of submission. These procedures do not apply for requests for supplements to existing grants.

Address all applications as well as requests for forms or additional information to the Division of Research Grants, National Institutes of Health, Bethesda 14, Maryland.

NEW NURSING MANUAL

Design for Statewide Nursing Surveys: A Basis for Action is the title of a new manual containing the latest techniques for finding the extent of nurse shortages and removing some of the causes.

This manual was prepared by the Division of Nursing Resources Public Health Service, under the direction of Margaret G. Arnstein, R. N., M.P.H., and can be obtained from the Superintendent of Documents, Government Printing Office, Washington, 25, D.C., for 50¢.

Veterans Administration

Chief Medical Director—WILLIAM S. MIDDLETON, M.D.

Deputy Chief Med. Dir.—R. A. WOLFORD, M.D.

ASSIGNMENT

Dr. William B. Tucker, Chief of the Medical Service at the Veterans Administration Hospital in Durham, N.C., and Professor of Medicine at Duke University, has been appointed Director of the Tuberculosis Service in the Department of Medicine and Surgery at the Central Office of the Administration. The appointment will be effective September 1.

Dr. Arthur J. Klippen has been appointed Deputy Director of Clinics in the Department of Medicine and Surgery of the Central Office of the Veterans Administration.

Dr. Halbert H. Earp who has been succeeded by Dr. Klippen, has been appointed chief medical officer of the VA regional office clinic in Pass-A-Grille, Fla.

Dan J. Macer has been assigned as manager of the Veterans Administration hospital at Sunmount, N.Y. Mr. Macer has served as assistant manager of VA hospitals at Fort

Wayne, Ind., Kerrville, Texas, and Augusta, Ga.

Willis O. Underwood, who has been manager of the Sunmount hospital has been transferred to the Central Office of the Veterans Administration in Washington, D.C.

VETERAN POPULATION

The veteran population at the end of February was 22,226,000; the estimated figure for March was 22,261,000 as against the actual figure of 21,616,000 for March 1955.

The average daily patient load in VA hospitals was 112,430 in March to which 3,300 should be added for those veterans in non-VA hospitals.

Miscellaneous

REHABILITATION TEAM FOR BURMA

A team of Burmese physicians, nurses, therapists and psychiatrists will receive training in rehabilitation at the New York University-Bellevue Medical Center. Dr. George E. Armstrong, Director of the Center announced that the Rockefeller Foundation has made a grant of $30,000 for the purpose.

SYNTHETIC RESERPINE

It has been done! Scientists Dr. Frank L. Weisenborn and Dr. Patrick A. Diassi of the Squibb Institute for Medical Research have developed a method for producing reserpine synthetically. This was reported in the May 5 issue of the Journal of the American Chemical Society.

Reserpine is a very important drug these days in the treatment of hypertension and emotional disturbances. The drug is obtained from the Rauwolfia plant which comes from India. Should the supplies of the plant be cut off for some reason or other reserpine could now be made in the laboratories in the United States.

GUESTS AT 2D ANNUAL DINNER, NEW YORK CHAPTER, LOYAL ORDER OF THE BOAR

U. S. Army Photo

(L to R) Brig. Gen. Harold W. Glattly, First Army Surgeon; Dr. Frank B. Berry, Ass't Sec'y of Defense (Health & Medical); Maj. Gen. Charles Reynolds (Ret.) Surg. Gen. USA (1935-1939); Maj. Gen. George E. Armstrong (Ret.) Surg. Gen. USA (1951-1955).

GERM-FREE ANIMAL TRANSPORTATION

Studebaker of South Bend, Indiana, is building a vehicle for the transportation of germ-free animals from the Lobund Institute, University of Notre Dame South Bend to other cities.

The specially constructed vehicle must provide for filtered air, constant temperature, and regulated humidity. Speed also is an essential in the transportation of these delicate animals.

MEETING

The Second Congress of the World Confederation for Physical Therapy will be held at the Hotel Statler, New York, June 17-23. Dr. Salk will talk on June 18.

Headquarters of the American Physical Therapy Association are located at 1790 Broadway, New York 19, N.Y.

OPHTHALMOLOGY MEETING

The Pan American Association of Ophthalmology will meet in New York City April 7-10, 1957 for the Fourth Interim Congress. The Congress will be held in conjunction with the annual meeting of the National Society for the Prevention of Blindness.

Those who wish to present papers are invited to communicate with Dr. John M. McLean, The New York Hospital, 525 East 68th Street, New York 21, N.Y.

"MEDICAL HORIZONS"

September 9 is the date for the return of Ciba's "Medical Horizons" on an 85-station national network. The television audience is promised a 39 weeks series which will appear on Sundays from 4:30 to 5:00 p.m., New York time.

FORD GRANT

The Ford Foundation, 477 Madison Avenue, New York 22, New York, recently made available $10,000,000 for grants to the National Fund for Medical Education.

This amount of money would be paid over a period of five to ten years depending on the amount of money matched by the National Fund. A maximum grant in any one year would be $2,000,000.

The purpose of the grant as pointed out by H. Rowan Gaither, Jr., president of The Ford Foundation, is to strengthen the financial support for medical schools throughout the United States, both public and private, and to develop new sources of such support.

INSTALLMENT PLAN FOR HOSPITAL EQUIPMENT

The installment plan has spread to the field of hospital equipment. The American Sterilizer Company, Erie, Pa., has developed a plan in which hospitals can pay as little as 10 per cent down on new equipment supplied by that company. The balance can be paid out in six to 60 equal monthly payments.

NEED FOR PHARMACISTS

John A. MacCartney, president of the American Pharmaceutical Association and professional relations manager for Parke, Davis & Company, recently recommended "solidly-based" and "uniform educational standards" for pharmacy schools. He also warned of "a very real shortage of recruits" in the profession. He said, "Our graduates are doing little more than replacing those in our ranks who die or retire. Thus, we are making no provision for a vastly increased population."

CAUSES CONTRIBUTING TO VACATION ACCIDENTS

The factors most frequently involved in accidents that write a tragic ending to many a happy holiday, as listed by the Private Truck Council of America, are:

Speed. Nearly 3 out of 10 drivers in fatal accidents are violating a speed law at the time of the accident. One-third of the drivers involved in rural traffic accidents are violating a speed law at the time of the accident compared with one-fifth in urban accidents.

Alcohol. In nearly one-fourth of the fatal traffic accidents a driver or adult pedestrian has been drinking.

Vehicle Condition. About 6 per cent of the

cars involved in fatal accidents are found to have one or more unsafe conditions.

Fatigue. About 1 out of 17 drivers involved in fatal traffic accidents are found to be in a physical condition that could be a contributing factor in the accident. In about three-fifths of these cases the drivers are fatigued or asleep. A short rest, a quick cup of coffee, often will make a life-and-death difference in alertness and caution on the highway.

Weather. In about 1 out of 6 fatal accidents the weather is rainy, snowy or foggy. Rain is present in about 3 out of 4 of the bad weather cases.

ADDRESSES CHANGED

The Secretariat of *The World Medical Association* and *United States Committee, Inc.*, has changed its address to 10 Columbus Circle, New York 19, N.Y., Phone: COlumbus 5-2190.

AERO MEDICAL ASSOCIATION HISTORY

Doctors in the Sky by Colonel Robert J. Benford, USAF (MC) tells the story of the Aero Medical Association from its creation by Dr. Louis H. Bauer in 1929 to the present time.

The Association numbers among its officers and members those who helped establish aviation medicine as a recognized specialty. The author, a leader in that specialty and an officer of the Association, has told the story objectively and well.

In twelve chapters are recounted the birth of the Association, the beginning of its official journal, the struggle to establish physical

MANNHEIM (GERMANY) DISPENSARY OPENING

U. S. Army Photo

300 visitors attended the opening ceremonies of the Mannheim Dispensary in Germany. This is said to be one of the finest in Germany. In the above picture are shown (L to R) Col. Charles F. McNair, HACom CO; Col. Jackson B. Dismukes, Hq. Area Command Surgeon; Maj. Gen. Alvin Gorby, USAREUR Surgeon; and Prof. Dr. Julius Berendes, Director of Mannheim's City Hospital.

standards for airline pilots as well as military pilots, the contribution to World War II and other topics of interest.

The book is well printed and lavishly illustrated. It is an important contribution to the general history of medicine as well as to the history of the special subject with which it deals.

The book is published by Charles C Thomas of Springfield, Illinois, and sells for $8.75.

Honor Roll

Since the publication of our last list, the following sponsored one or more applicants for membership in the Association:

Lt. Col. Wilber H. Arnberg, MSC, U. S. Army
Col. James E. Ash, U. S. Army, Ret.
Lt. Elroy Simoes Bona, Mc, Brazilian Navy
Col. Warner F. Bowers, MC, U. S. Army
Lt. Col. Bruce L. Bushard, MC, U. S. Army
Rear Adm. W. Dana, (MC), U. S. Navy
Dr. Ernesto Davila Diaz
Capt. Hazel L. Evans, ANC
Lt. Col. Donald J. Francis, MC, U. S. Army
Lt. Col. Joseph J. Frankel, MC, U.S.A.R.
Dr. Howard Glaesner
Maj. Gen. Alvin L. Gorby, MC, U. S. Army
Med. Dir. Ernest E. Huber, USPHS
Rear Adm. W. F. James, (MC), U. S. Navy
Lt. Col. Mohd Akbar Khan
Lt. Margaret A. Kloetzli, NC, U. S. Navy
John F. Maloney, M.D.
Dr. Vladamir Markovich
Surg. Lester R. Nagel, USPHS
Asst. Surg. Gen. David Price, USPHS
Lt. Col. Charles J. Rick, DC, NY Air NG
Major Samuel Weiss, MC, AUS
Lt. Col. Hsia Shao Yao, MC, Chinese AF
Col. Abner Zehl, MC, U. S. Army

BOOK REVIEWS

CARDIAC DIAGNOSIS—A PHYSIOLOGIC APPROACH. By Robert F. Rushmer, M.D., Associate Professor of Physiology and Biophysics, University of Washington Medical School. 447 pages, illustrated. W. B. Saunders Company, Philadelphia and London. 1955. Price $11.50.

This work, though not the first, presents a unique approach to cardiac diagnosis based largely on the changes of physiological function.

The material is presented in five parts. Part One, "Functions of the Normal Cardiovascular System" consisting of four chapters, is devoted to the discussion of the anatomic, physical and functional aspects of the cardiovascular system as a whole.

"Regulations of the Cardiovascular System," composing Part Two, is covered in three chapters. The material in this section covers the regulation of the heart and the peripheral vascular system with special attention given to their neural and hormonal control.

"Congestive Heart Failure" is covered in two chapters and composes the material of Part Three. Herein the subject of cardiac reserve and the etiology of cardiac failure is most interestingly and informatively presented. The subject of sub-clinical failure, which may be present for long periods of time, thus without symptoms, is apparently compensated for by the various compensatory mechanisms. The different forms of cardiac reserve are most informatively discussed in this section. The discussion of this phase of cardiac diagnosis might well be read by any physician interested in heart disease. Part Four, composed of six chapters, is devoted to "Methods of Cardiac Diagnosis." The importance of the recognition of the early manifestation of cardiac pathology is most informatively presented. The discussion of the various methods which may be used to detect the cardiac disease is well handled and instructively conveyed.

Part Five (the last section) is devoted to "Diagnosis of Cardiac Disease." Under this general caption "Myocardial Ischemia," "Myocarditis," Valvular Disease," "Congenital Heart Disease," and "Possible Heart Disease" are considered. The author clearly and most informatively points out the application of the fundamental concepts and diagnostic methods which were discussed in the previous section of this work to the clinical problems encountered in the above five categories of cardiac disease.

A comprehensive index covers well the subject material of this treatise.

The book is replete with an unusually large number of excellent schematic diagrams and photographs illustrating the subject matter. Number as they are, none can be omitted without detracting from this most valuable work.

This book is recommended to any physician interested in cardiac disease, its early recognition, diagnosis and classification. It should be widely advertised and made available in every medical library, cardiac clinic, and physician's office.

COL. CHARLES R. MUELLER, USA, RET.

AMA SCIENTIFIC EXHIBITS—1955. 800 pages, illustrated. Published for the American Medical Association. Grune & Stratton, New York. 1955. Price $20.00.

Anyone who has attended the annual meetings of the American Medical Association is familiar with the excellence of the scientific exhibits and it is always a problem to decide whether to study the exhibits and miss the meetings or attend the meetings and miss the exhibits. Now it is possible to attend the meetings and leisurely review the exhibits at home with this book.

Under Dr. Hull's direction the best of the scientific exhibits have been reproduced in this well bound volume. The 312 exhibits which are illustrated constitute only about one-third of the total exhibits, but all are listed by title and with a brief abstract. Expense prevents the use of color but otherwise, the illustrations show the exhibit just as it appeared at the meeting.

The preparation of this volume has been a tremndous task for Dr. Hull and his associates and also for the exhibitors who cooperated by furnishing photographs.

The end result is well worth while for it permits a permanent record of these very instructive displays.

COL. HUGH R. GILMORE, JR., MC, USA

CLINICAL ORTHOPAEDICS. No. 6. By Anthony F. DePalma, M.D., Editor-in-Chief. 219 pages, illustrated, J. B. Lippincott Company, Philadelphia and Montreal. 1955. Price $7.50.

In this sixth volume of a series of original articles published in book form the original format has been retained.

An additional third section entitled, "Items," has been added in this volume. The editors have chosen the very timely subject, *Endoprosthesis,* as the theme of Section One. Ten separate articles representing a variety of approaches to the management of the difficult hip problem are included dealing with the considerations of the indications, contraindications, choice of materials and technics.

Section Two on general orthopaedics includes fourteen miscellaneous articles. The papers on growth acceleration in Legg-Calve-Perthes' syndrome, a method for osteotomy in the treatment of humeral cubitus valgus, and the management of suppurative arthritis complicating artificial hips are indeed stimulating.

In Section Three there are two spectator letters which make interesting reading and an article pointing out the reaction due to the nuts in a Wilson type of fusion as not being due to the metal but rather to the nylon portion thereof.

The articles are clearly wirtten, well illustrated with black and white prints, charts and line drawings. References are placed at the end of each article. An adequate index is included.

This book contains much interesting and informative material which should be read by orthopaedists as well as all others interested in the management of orthopaedic conditions. It would make a worthwhile addition to all medical libraries.

COL. JOSEPH W. BATCH, MC, USA

PHYSIOTHERAPY IN SOME SURGICAL CONDITIONS. By Joan E. Cash, B.A., M.C.S.P. Printed in Great Britain. 350 pages, illustrated. J. B. Lippincott Co., Philadelphia and Montreal. (Authorized U.S. publisher) 1955. Price $5.00.

The object of this book is to try to show why physiotherapy is of value in some of the diseases and injuries treated by the surgeon. The author does her work in full cooperation with the surgeons at the United Birmingham Hospitals, so many of the concepts and much of the terminology is thus typically British—a point of interest to American readers accustomed to a changing terminology including "physical therapy" and "physical therapist." The author limits the role of physiotherapy for the surgical patient to the prevention and treatment of complications, a fact that materially limits the scope of the book.

The book is organized into chapters by subjects including breast, heart, lungs, abdomen, peripheral vascular disease, kidneys, peripheral nerve injuries, neurosurgical conditions, amputations, and fractures. An obvious omission is the requirements for recent advances in reconstructive, plastic, and orthopedic surgical procedures, as well as the surgery for congenital and progressive neuromuscular and musculoskeletal disabilities.

The book is clearly and simply written and appears basically sound although the surgical disciples and physiatrists will certainly find points of disagreement and difference of opinion from those stated. This fact is borne out when the author advocates the use of dry heat in the management of infections, whereas many readers, indeed many patients, will prefer the application of moist heat under similar circumstances. The expectant, empirical, and symptomatic approach to therapeutics of any kind invariably leads to these differences of opinion and perhaps cannot be avoided in this type of writing.

The strongest sections of the book are the sections on thoracic and neurosurgical conditions where the role of pre- and postoperative routines are clearly stated and the special investigative routines, including electrodiagnostic methods, are spelled out. The book is well written in clear and simple language and will prove interesting reading to the practicing physical therapist as well as the clinical supervisors of student therapists. The bibliography will be of special help and ready reference for student nurses as well as physical therapists.

LT. COL. JOHN H. KUITERT, MC, USA

PROTEIN MALNUTRITION. Proceedings of a Conference in Jamaica (1953) sponsored jointly by UN, WHO, and Josiah Macy Jr. Foundation. 300 pages, illustrated. Columbia University Press, IDS, New York. 1956. Price $3.50.

The principal subject of this book is kwashiorkor. This dietary deficiency disease of infants and young children is widely prevalent in certain parts of the world, such as Africa, India, Central America, Brazil, and other regions. Although the disease shows geographical variations, the dominant factor in its etiology, but usually not the only one,

is protein depletion of the organism. For this reason the somewhat vague term of "protein malnutrition" has been adopted for this and other related disorders. In the form of *marasmus*, the condition is by no means unknown in the United States and Europe.

The book is a verbatim report of a conference of 26 experts on the subject from various parts of the world, held in Jamaica in 1953, the fourth such international conference to be devoted to this problem since 1949. At four sessions consideration was given to the biochemistry, the pathology, the clinical aspects and treatment, and to epidemiology and prevention. The result is a noteworthy epitome of the current knowledge of kwashiorkor. There is, also, a discussion of marasmus, veno-occlusive disease of the liver, cirrhosis, and human nutrition generally. Although the clinical features of kwashiorkor now seem well established and adequate methods of treatment and control are available despite many practical difficulties, it is apparent from the discussion that much remains to be done in the fields of the biochemistry and pathology of so-called protein malnutrition.

The book is well-printed and capably edited, good bibliographies at the end of each chapter, numerous charts and diagrams, and 24 excellent plates showing case material and pathological examinations. Unfortunately, there is no index. The book should be of special interest and value to nutritionists, pediatricians, and public health workers in the international field.

COL. JAMES A. TOBEY, MSC, USA, RET.

LABORATORY MANUAL FOR INTRODUCTION TO PHARMACY. 3rd Ed. By Henry M. Burlage, Ph.D., Editor, Dean and Professor of Pharmacy and Pharmaceutical Chemistry, College of Pharmacy, The University of Texas. 271 pages, perforated margin. The Blakiston Division, McGraw-Hill Book Co., Inc. New York, Toronto, London. 1956. Price $4.50.

This laboratory manual consists of laboratory procedure necessary in the training of students entering colleges and schools of pharmacy as orientation experience in order that through progressive training they will be able to proceed with a fundamental knowledge to that of more advanced courses in pharmacy. Training in the simple essentials to the more complicated laboratory manipulative skills is excellently and progressively developed by this manual.

The manual could be said to consist of two parts; the first 79 pages consisting of the Preface, Table of Contents, Rules to be observed in Pharmaceutical Laboratories, Rules for Notebook Work or Record of Results, Laboratory First Aid and other precautions, Apparatus List, and 20 experiments. The second portion consists primarily of the experimental report forms where the student may conveniently record the data of each experiment. Perforated sheets allow for easy removal for submission to the laboratory instructor and holes have been punched to allow for student binding in a 3 hole note book once returned. The last 3 pages of the second half includes the Bibliography.

The authors are to be commended for including the essentials to the sound procedures necessary for pharmacy laboratory training in such a simplified manner. This manual is intended to accompany a 3rd Edition of the text Introduction to Pharmacy by the same authors.

LT. COL. CLAUD D. LAFORS, MSC, USA

PRACTITIONERS' CONFERENCES HELD AT THE NEW YORK HOSPITAL—CORNELL MEDICAL CENTER. VOL. 3. Edited by Claude E. Forkner, M.D., F.A.C.P., Professor of Clinical Medicine, Cornell University Medical College. 293 pages. Appleton-Century-Crofts, Inc., New York. 1956. Price $6.50.

The intent of this volume is to enable the reader to share the advantages of a great medical center. However, the physicians on the panel are not from one center, but have been selected from medical schools and hospitals in the New York area. Often the doctors do not agree. This adds spice to the discussions. There is an occasional touch of humor. For example: Chairman Forkner, "Dr. Spain, cannot you help us out with your antiallergic agents to prevent colds? The *Readers' Digest* recommends the antihistaminics."

The subjects covered are: cancer of the skin and oral cavity, the detection of early cancer, Hodgkin's disease and lymphosarcoma, ulcerative colitis, eczema including seborrheic dermatitis and contact dermatitis, the minor veneral diseases, tumors of brain, convulsion seizures, neurovascular syndromes of the shoulder girdle, the common cold, and hay fever.

At the end of each conference there is a summary in which the conclusions are itemized. A reference is also included.

Physicians will be stimulated by this interesting collection of wisdom, both therapeutic and diagnostic.

PHILIP H. SMITH, M.D.

IMPARTIAL MEDICAL TESTIMONY. Report By A Special Committee of the Association of the Bar of the City of New York on the Medical Expert Testimony Project. 188 pages. The Macmillan Co., New York. 1956. Price $3.95.

This report describes the three year experiment, beginning December 1952, in medicolegal collaboration for the better administration of justice with particular reference to personal injury cases and the incidental reduction in delay in disposition of cases. The experiment was begun in the Supreme Court of New York County and extended to Bronx County.

At a pre-trial hearing where wide divergence of medical testimony was apparent, the judge requested an examination and report from one or more independent and impartial medical experts. These are chosen by the clerk of the court from a panel of a multi-specialist list. The medical report was sent to the judge and both adversaries. The expect may be called at the trial by the judge and be subjected to cross examination.

All expenses of the medical expert are paid by the City on approval of his bill by the judge. As a result of these reports, many modifications of claims result, and many out of court settlements are made with resulting elimination of one-fifth of the trials. If the cases are tried, many days of receiving medical testimony are eliminated, with an estimated savings to taxpayers of $750 a day.

This report of the Special Committee is favorable and recommends consideration in other jurisdictions. It is suggested that actions in insurance contracts, malpractice cases, probate proceedings, and other types of litigation where the physical and mental condition of any party may be in issue, may be fertile fields for experimentation in furnishing impartial medical testimony.

In addition to statistical reports, the book contains as exhibits the various forms and report forms used in operation of this project.

COL. EDWARD A. COATES, JR., USA, RET.

PLANNING NEW INSTITUTIONAL FACILITIES FOR LONG TERM CARE. By Edna E. Nicholson, Executive Director, The Institute of Medicine of Chicago. 358 pages. G. P. Putnam's Sons, New York. 1956. Price $4.50.

The author presents a comprehensive study conducted over a period of ten years, in which she reviews the changing picture and trends of medical care requirements for chronically ill and aged persons. She has displayed sympathetic understanding and a deep insight into the needs of the chronically ill and aged. She also reminds the readers to consider this group of people as individuals with their natural rights to individual differences.

This study explains how the recent advances in medicine have changed the types of installations and the character of medical care needed. Careful study must be carried out when planning for installations for chronically ill and aged in order to determine exactly what type each community requires and will be able to support.

The subject of expansion of existing facilities versus new building is discussed as well as expansion of general hopitals versus independently operated installations. There are definite advantages and disadvantages to both sides, as this study indicates, especially in regard to the integrated continuous care and for the long term patient, the well but confused aged person and the older patient whose infirmities increase with age. Dangers of over-specialization in care are pointed out when the installation is completely divorced from a general hospital causing a complete breakdown in the continuity of the care of an already insecure person. Rehabilitation facilities are considered.

The study includes extensive information on how the public can be educated to recognize its own community's needs for the care of chronically ill and aged. Many facilities may be in existence but are not known or utilized to their fullest capacity because each one is operating as an independent agency. Realization of the interdependence of all personnel (doctors, nurses, public health agencies, social workers, financial aid groups, etc.) related to the care of this group and a combining of their capabilities could be a distinct aid in the community's planning.

After the community understands and accepts the need for either expansion of general hospital facilities or the construction of an independent unit as part of their health program, there is the problem of funds. Methods of cost estimations and exploration of financial resources are presented. The author has emphasized the need for gathering adequate data before the actual fund raising can be planned.

Estimation of personnel requirements depends on the size of facility to be constructed and whether it is to be a unit of a general hospital or the nursing home type of installation. Whatever the decision, as Miss

Nicholson points out, legal requirements and professional standards must be met to safeguard the quality of care to be given.

There are chapters devoted to organization, ownership and its legal aspects; services to be provided, buildings and architects, locations and sites, patient areas, equipment, supplies and costs.

This book seems to cover all angles of the care of long-term patients, all ages and degrees of illness. It is of interest to all medical personnel and an invaluable aid for anyone planning for the increased numbers of long-term illness patients, and the group with the increased life span.

MAJOR ELIZABETH L. BREITUNG,
ANC, USA

HYPNOSIS AND ITS THERAPEUTIC APPLICATIONS. Edited by Roy M. Dorcus, Ph.D., Professor of Psychology, Professor of Psychology (Medicine), and Dean, Division of Life Sciences, University of California at Los Angeles. 314 pages. The Blakiston Division, McGraw-Hill Book Company, Inc., New York. 1956. Price $7.50.

This book is a result of a course of lectures given on hypnosis at the Division of Postgraduate Medical Education, Extension Division of the University of California at Los Angeles. It is an accumulation of twelve papers written by seven psychologists and a dentist. The purpose of the book is to acquaint physicians, psychologists, and dentists with the technics of hypnosis. The authors emphasize that methods of induction into the hypnotic state must be tailored to fit the needs of the subject and to help professional groups appraise how hypnosis can be of service to them.

Unfortunately, there is considerable repetition, and the subject is not very systematically presented. On the other hand, any person desiring to understand hypnosis will gain the necessary information in this volume. The editor has well stated that caution in recommending the application of hypnotic technics must be taken, and the authors do not perceive hypnosis as a panacea but simply as a tool in diagnostic and therapeutic procedures. The first paper presents the theories, the second the methods of induction, the next five papers the experimental results, and the last five papers discuss the therapeutic application of hypnosis. This volume is not presented as a textbook, as each paper is presented as a separate entity, and the pages numbered accordingly. References are given at the end of each paper. The whole volume is indexed.

CDR. JAMES L. MCCARTNEY,
MC, USNR, RET.

INTEGRATED GYNECOLOGY—PRINCIPLE AND PRACTICE. Three Vols. By I. C. Rubin, M.D., and Joseph Novak, M.D. 1925 Pages, illustrated. The Blakiston Division, McGraw-Hill Book Company, Inc. New York, Toronto, London. 1956. Price $65.00.

This three volume set of books covers a tremendous amount of material in the field of gynecology. The authors have spent a lot of time in planning and compiling the work. A single volume would have been unwieldy. Since each volume is complete in itself handling of the work is easier.

Volume I covers the anatomy of the female organs. I found this a good quick review. Also considered are the evolution and involution of the urinary and genital organs, physiology, gynecologic examination, congenital anomalies of the genito-urinary organs, injuries of the female sex organs, effect of toxic agents on the female genital organs, deformities and displacements of the internal genital organs and inflammatory diseases of the female genitals.

Some of the above subjects covered were a little too much in detail; others could have been expanded. The continuity was so good that it led one to read most of the chapters in detail.

Volume II covers tumors of the female sex organs, constitutional disorders, and gynecology and disorders of reproduction. This volume contains many excellent plates of clinical photographs, diagrams, and pathological slides.

Volume III starts with the relationship between the reproductive and other body systems. This chapter is an excellent one. There are 300 pages followed by 61 pages of bibliographic references, which give a vast amount of information on integrated gynecology. This alone is worth the investment.

Volume III covers operative gynecology, giving the general principles involved and the abdominal and vaginal operations in detail. The illustrations of the different operations are certainly excellent, but obviously for the resident in training or the gynecologic specialist.

Integrated Gynecology is not for the medical student. For the gynecologist and the student of gynecology there is a wealth of material. We recommend that they share the

experiences of these learned gynecologists.

The volumes mechanically are excellently made; the type is for easy reading. Since there are three volumes the handling is made easy.

CLAYTON H. HIXSON, M.D.

EXPERIMENTAL TUBERCULOSIS. Ciba Foundation Symposium. Bacillus and Host, with Addendum on Experimental Leprosy. Edited by G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch. 396 pages. Little, Brown and Company, Boston. 1955. Price $9.00.

In London, England 5-7 October 1954, the Ciba Foundation collected a distinguished group of investigators under the Chairmanship of Dr. Arnold Rich, Pathologist of Johns Hopkins University. These men, representing principal research workers from England, France, Denmark, Switzerland, Italy and the United States were to discuss "The Tubercle Bacillus and the Reactions of the Host Tissue."

Individual papers were presented, then opened for discussion which in each case helped to separate the known from the unknown, to suggest goals for future studies, and act as a stimulus to all. Dr. Rich felt that this cross fertilization of ideas was an important part of the meeting.

Among the subjects discussed were relationships between various chemical components of the tubercle bacillus and effects produced by the disease. Others covered hypersensitivity and immunity; acquired and native resistance; newer concepts of drug therapy in relationship to the bacillus; and included discussion of many investigative tools as chemical extraction of purified substances; living tissue cultures; and recent serological techniques. Illustrations are of excellent quality and well chosen.

This book is of importance not only in the field of tuberculosis and leprosy which it touches lightly but in the broad field of Infectious Diseases.

EDMUND G. BEACHAM, M.D.

DISEASES OF THE LIVER. Edited by Leon Schiff, M.D., Ph.D., Professor of Clinical Medicine, University of Cincinnati, College of Medicine; 28 contributing authors. 738 pages, 244 figures. J. B. Lippincott Co., Philadelphia and Montreal. 1956. Price $16.00.

In keeping with the present-day trend toward extreme specialization, Doctor Schiff, with the help of devoted experts in each subdivision, has compiled an interesting and valuable book on the liver. Appropriately, first, the newer aspects of anatomy, physiology, biochemistry and experimental work are concisely recorded. A special reference to hepatectomy and surgical injury to the liver is noteworthy in view of the increasing frequency of hepatic lobectomy in humans. Further recognition of the close cooperation between surgeon and internist, so necessary nowadays, is evidenced by several chapters written by surgeons. They include portal hypertension by Doctor Linton, hepatic abscess by Doctor DeBakey, and diseases of the gallbladder and extra hepatic bile ducts by Doctor Zollinger, et al.

As the liver can seldom be considered as presenting primary disease, most of this book is concerned with secondary involvement, i.e., viral diseases, toxic agents, abnormal metabolic effects, bacterial diseases, parasitic localization, effects of circulatory failure, and the various cirrhoses. However, the most important chapters, from a clinician's point of view, are those discussing his daily problems as they present themselves. To this end, jaundice by Doctor Schiff, portal hypertension by Doctor Linton, hepatic coma by Doctor Davidson, needle biopsy of the liver, and liver function tests by Doctor Maclagen, are excellent and to the point.

With excellent bibliographies, appropriate illustrations, and composite charts, this book is highly recommended as a ready reference for every doctor encountering liver disease in his daily practice.

CAPT. L. J. POPE, MC, USN

NEW BOOKS

Electrocardiography, Fundamentals and Clinical Application, by Louis Wolff, MD, 2d ed., W. B. Saunders Co., Philadelphia, Pa. Price $7.00.

Clinical Recognition and Management of Disturbances of Fluid Balance, by John H. Bland, M.D. W. B. Saunders Co., Philadelphia, Pa. Price $11.50.

The Truth About Cancer, by Charles S. Cameron, M.D. Prentice-Hall, Inc., New York, N.Y. Price $4.95.

Color Atlas of Oral Pathology, Prepared under the auspices of the U. S. Naval Dental School, Bethesda, Md. J. B. Lippincott Co., 1956, Philadelphia, Pa. Price $12.00.

Laboratory Tests in Common Use, by Solomon Garb, M.D. Springer Publishing Co. 44 East 23rd St., New York 10, N.Y. Price $2.00.

Handbook of Medical Hypnosis, by Ambrose & Newbold. The Williams & Wilkins Co., Baltimore, Md. Price $5.00.

Outline of Orthopedics, by Adams. The Williams & Wilkins Co., Baltimore, Md. Price $7.00.

Textbook of Medical Physiology, by Arthur C. Guyton, M.D. W. B. Saunders Co., Philadelphia, Pa. Price $13.50.

An Introduction to Pack Transport and Pack Artillery, by Major Michael F. Parrino, Art. USAR. Queensland Publishing Co., New York, N.Y. Price $5.50.

In the Doctor's Office, by Esther J. Parsons, 2nd ed. J. B. Lippincott Co., Philadelphia, Pa. Price $3.95.

Health Observation of School Children, by Geo. M. Wheatley, M.D. and Grace T. Hallock. McGraw-Hill Book Co., Inc., New York, N.Y. Price $6.50.

Diagnosis and Treatment of Vascular Disorders, edited by Saul S. Samuels, M.D. The Williams & Wilkins Co., Baltimore, Md. Price $16.00.

Neuropharmacology, transactions of the Second Conference, May, 1955. Edited by Harold A. Abramson, Asst. Clinical Prof. of Physiology, Columbia University College of Physicians and Surgeons. Josiah Macy, Jr. Foundation, New York, N.Y.

Shock and Circulatory Homeostasis, Transactions of the Fourth Conference, Dec. 1954. Edited by Harold D. Green, M.D., Prof. of Physiology and Pharmacology, and Associate in Internal Medicine, Bowman Gray School of Medicine. Josiah Macy, Jr. Foundation, New York, N.Y. Price $5.00.

Pulmonary Carcinoma, Pathogenesis, Diagnosis, and Treatment. Edited by: Edgar Mayer, M.D. and Herbert C. Maier, M.D. J. B. Lippincott Co., Philadelphia, Pa. Price $15.00.

Campbell's Operative Orthopaedics, edited by J. S. Speed, M.D. and Robert A. Knight, M.D., 3rd edition, two volumes. The C. V. Moxby Co., St. Louis, Mo. Price $40.00.

Any of the above books may be ordered through the Association of Military Surgeons. Check book desired, and return this page.

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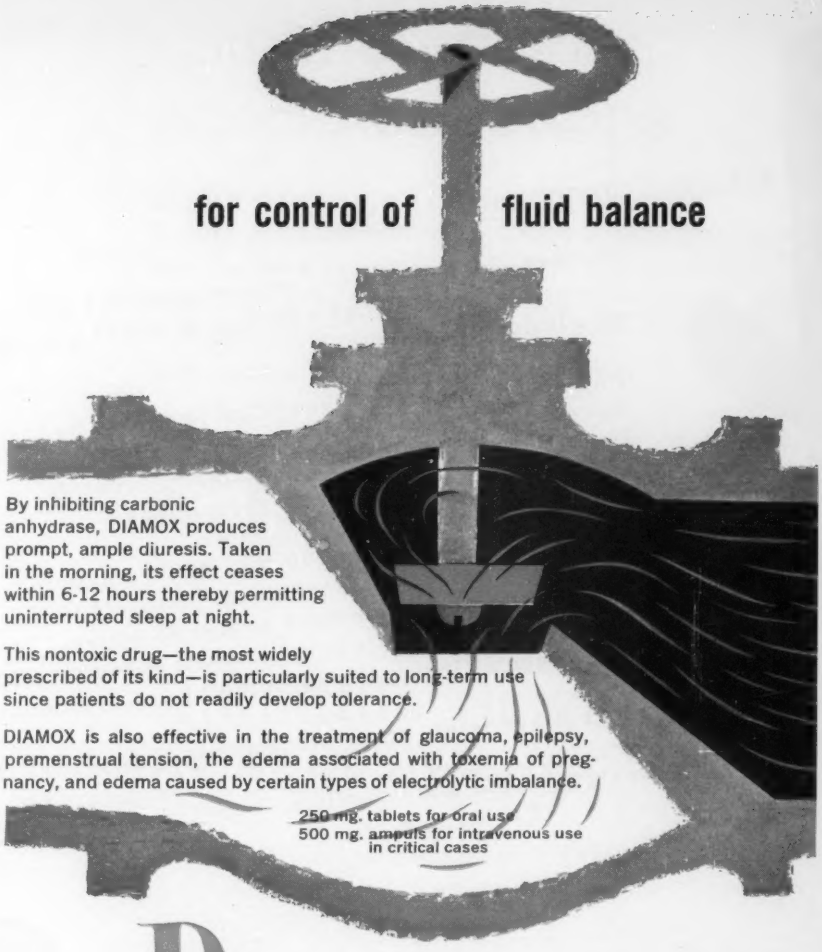

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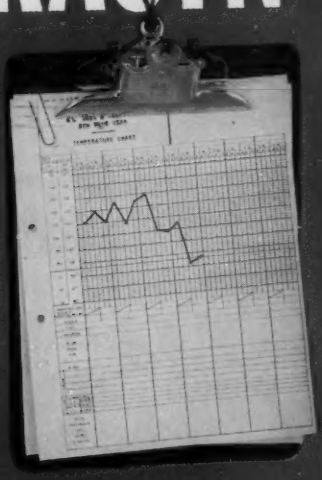

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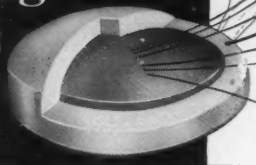

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(Buffered Prednisolone)

increase the flexibility of therapy with the "predni-steroids"

All *the benefits of prednisone and prednisolone* plus *greater antacid-to-steroid ratio to minimize gastric distress during maintenance therapy.*

The new 2.5 mg. tablets of 'CO-DELTRA' and 'CO-HYDELTRA' together with the 5 mg. tablets give the physician more latitude for precise adjustment of dosage to the individual patient's needs. Cost for either strength tablet is substantially the same as for the steroid alone and in addition the multiple compressed tablets assure routine co-administration of both antacid and steroid components.

Supplied: 'CO-DELTRA' (Prednisone Buffered) and 'CO-HYDELTRA' (Prednisolone Buffered) are available as Multiple Compressed Tablets, each tablet containing 2.5 mg. or 5 mg. of prednisone or prednisolone plus 300 mg. of dried aluminum hydroxide gel, and 50 mg. of magnesium trisilicate.

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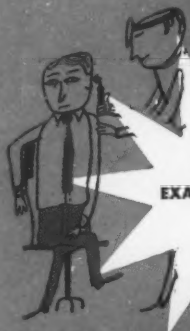
nonsensitizing . . .

rapid acting . . . deeply penetrating . . .

topical anesthesia

• Xylocaine Ointment (a new form of the widely accepted Xylocaine) is an unusually effective topical anesthetic free of irritating, sensitizing or toxic reactions.



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• Controls pain, itching and burning sensations. May also be applied to prevent pain or discomfort during examination and instrumentation.

• Available in a nonstaining, water soluble vehicle as 2.5% and 5% Xylocaine base in collapsible tubes (5% also available in wide-mouth jars) each containing 35 grams (approx. 1.25 ounces).

XYLOCAINE® OINTMENT ASTRA

(Brand of lidocaine*)

Xylocaine Ointment is now made available at the request of many physicians, surgeons, and anesthesiologists who routinely use Xylocaine HCl Solution.

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Astra Pharmaceutical Products, Inc.
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*U. S. Patent No. 2,441,498

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DELFEN is the first contraceptive *CREAM* reported to be clinically effective when used alone.

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DELFEN Cream contains the highest concentration of the most potent, nontoxic spermicide ever discovered.

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just like a fresh peach

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longest-acting motion-sickness remedy[1] effective in low dosage... controls motion sensitivity symptoms in minutes... one dose usually prevents motion sickness for 24 hours.

In recommended dosage Bonamine is notably free from side reactions . . . supplied as: BONAMINE TABLETS, scored, tasteless, 25 mg. . . . BONAMINE CHEWING TABLETS, pleasantly mint flavored, 25 mg.

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instant, deep anesthesia

of accessible mucous membranes

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a new form of the widely accepted injectable
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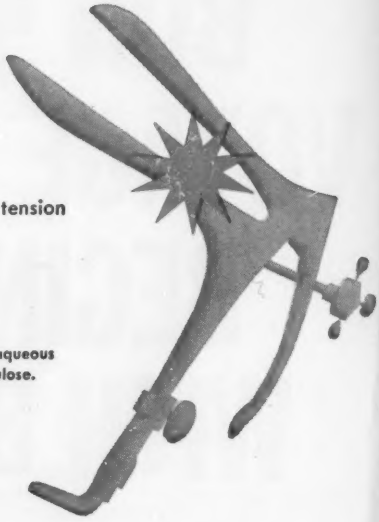

- Provides more effective anesthesia of longer duration than any comparable preparation used in the genito-urinary tract, ear, nose and throat.
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A detachable applicator cone and a key for expressing contents are included in each package.

*U.S. Patent No. 2,441,498

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ASTRA Pharmaceutical Products, Inc., Worcester 6, Mass., U.S.A.

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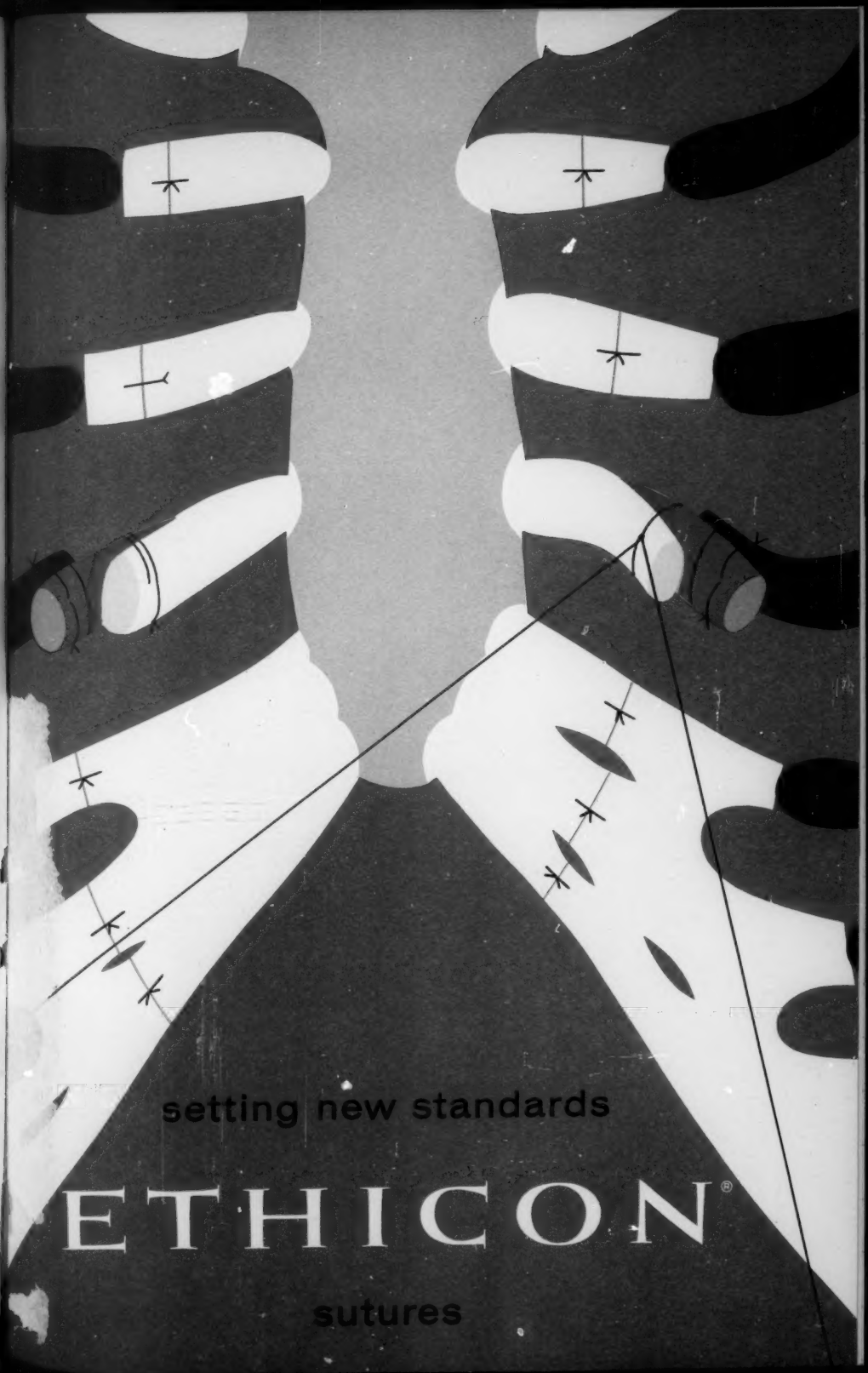
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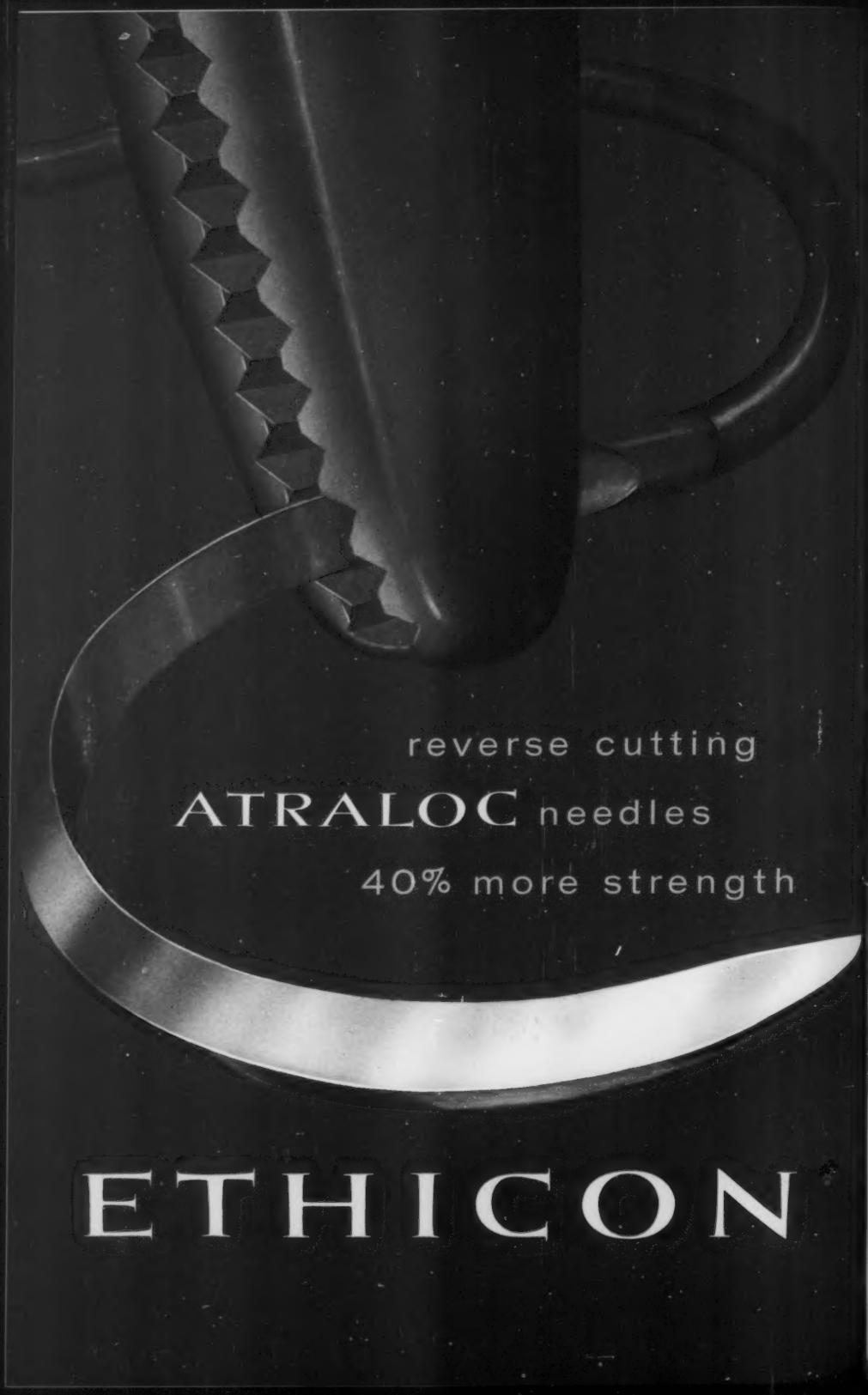
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1. Johnston, T. G., and Cazort, A. G.: J. Allergy 27:90, 1956. 2. Schwartz, E.: New York J. Med. 56:570, 1956. 3. Schiller, I. W., et al.: J. Allergy 27:96, 1956.

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A promising new agent in chemopsychotherapeutics, SPARINE has demonstrated impressive effectiveness in controlling acute excitation without inducing significant side-reactions.[1,2,3]

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1. Seifter, J., et al.: To be published. 2. Fazekas, J.F., et al.: M. Ann. District of Columbia 25:67 (Feb.) 1956. 3. Mitchell, E.H.: J.A.M.A. In press.

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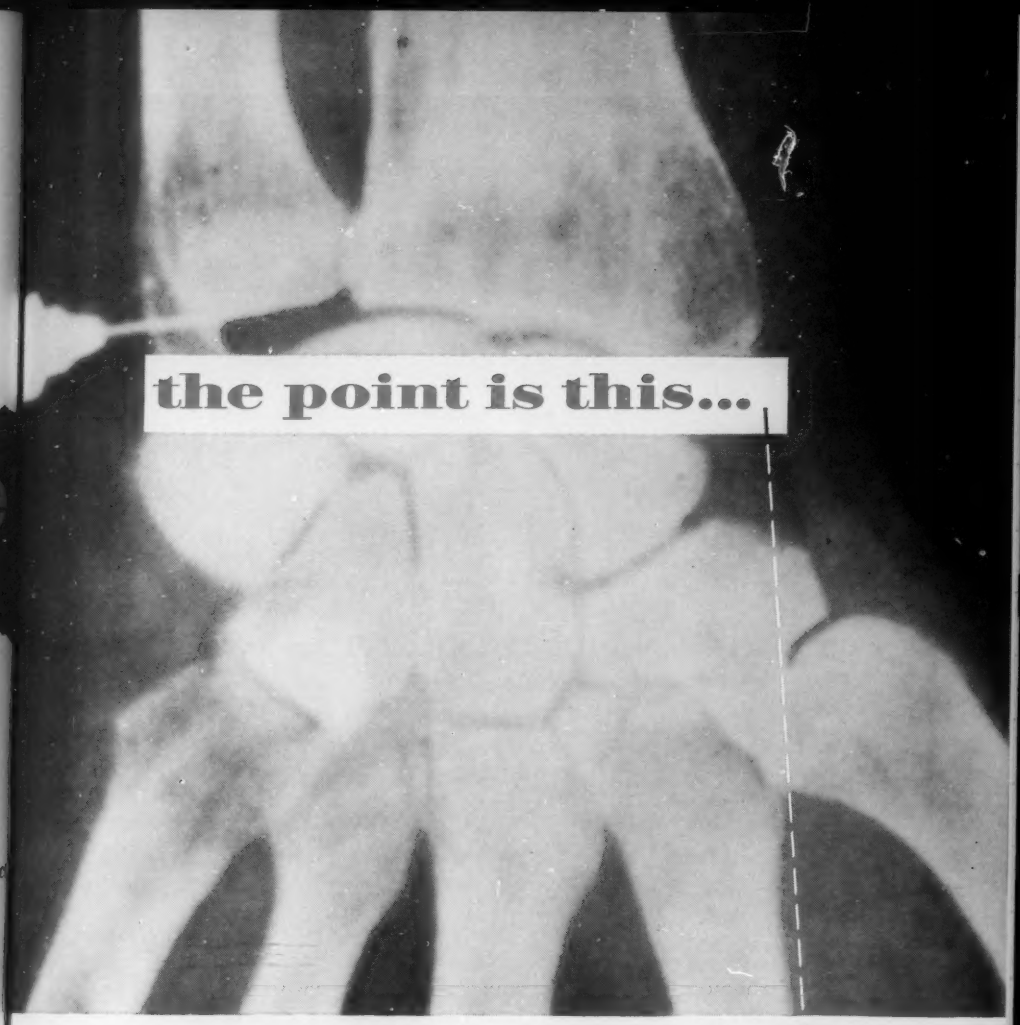

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produces superior results — greater symptomatic relief and longer-lasting remissions — in both rheumatoid arthritis and osteoarthritis.[1,2]

SUPPLIED: SALINE SUSPENSION HYDROCORTONE-T.B.A.—25 MG./CC., VIALS OF 5 CC.

References: 1. Hollander, J. L., *Ann. New York Acad. Sc.* **61**:511, May 27, 1955.
2. Hollander, J. L., *et al. J.A.M.A.* **158**:476, June 11, 1955.

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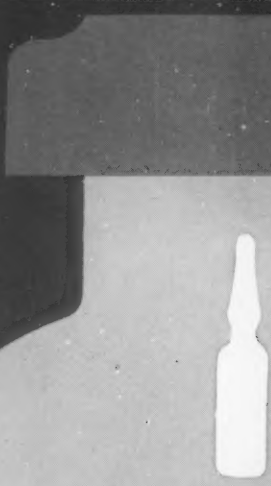

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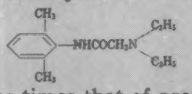
Trade Name: XYLOCAINE **Generic Name:** lidocaine*

Chemical Name: α-Diethylaminoaceto-2,6-xylidide

Chemical Structure:



Potency: Two to three times that of procaine.

Duration of Action: Two to three times that of procaine.

Anesthetic Index: 1.8. **Surface Anesthetic Index:** 8.

Safety Factor: Two to three times that of procaine (because smaller concentrations and volumes are clinically as effective).

Sensitivity: Allergic manifestations and sensitizing reactions have never been reported.

Inhibition of Therapeutic Action of Sulfonamides or Antibiotics: None.

Versatility: Effective in local infiltration anesthesia; in major conduction anesthesia; in temporary therapeutic blocks for relief of pain; in topical anesthesia.

Available on Request: Descriptive literature, bibliography, and trial supply.

Supplied: Vials, 0.5%, 1% and 2% in 20 cc. and 50 cc. without and with epinephrine 1:100,000; 100 cc. vials, 1% without epinephrine. Ampoules, 2 cc., 2% without and with epinephrine 1:100,000.

Astra Pharmaceutical Products, Inc., Worcester 6, Mass.

*U. S. PATENT NO. 2,441,498

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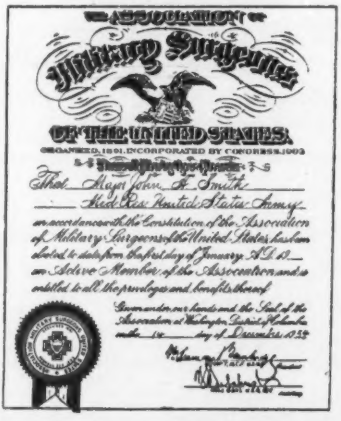

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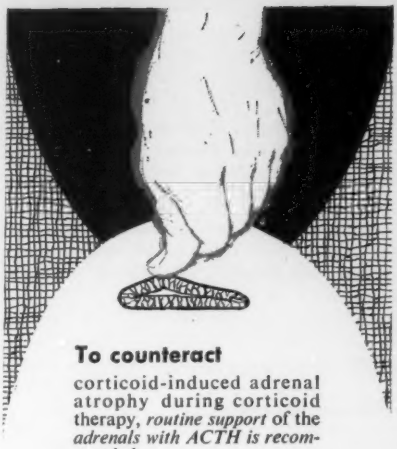

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Discontinue administration of corticoids on the day of the HP*ACTHAR *Gel* injection.

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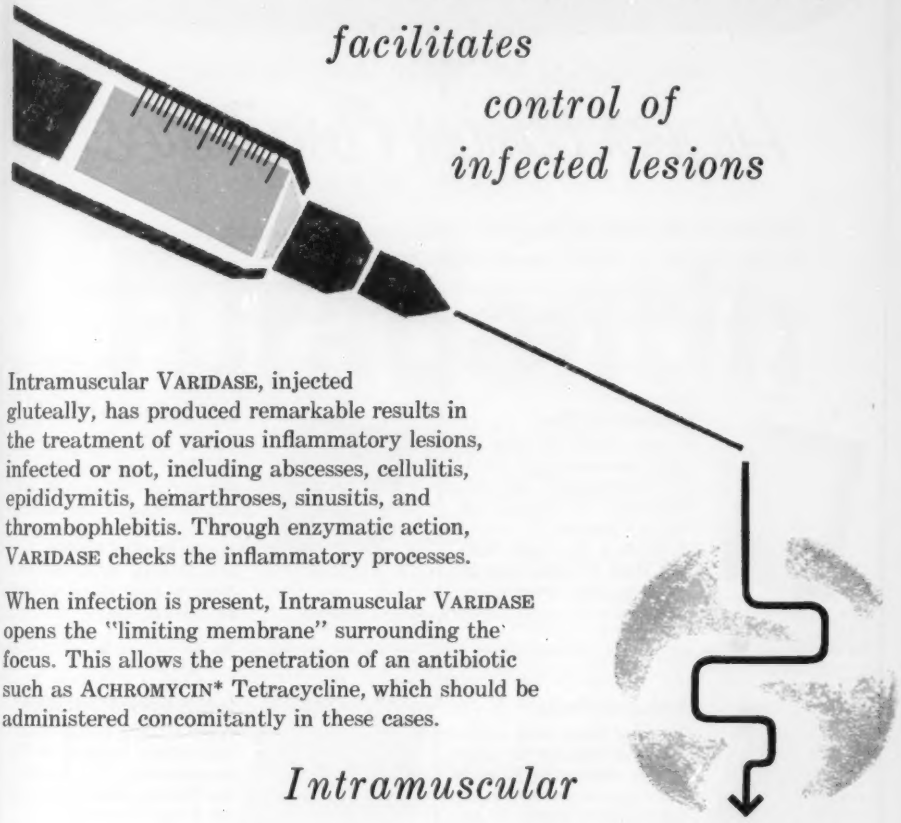

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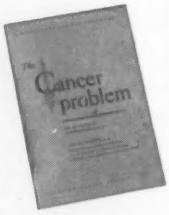

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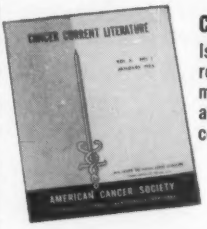

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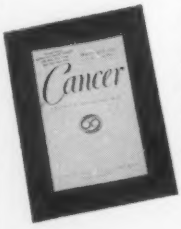

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in acute and chronic pyelonephritis, cystitis, prostatitis

Percentage of Effectiveness of Furadantin Against Various Strains of Bacteria in Vitro

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Furadantin	82.1	66.6	31.2	91.9	93.9	60.0	13.3
Antibiotic A	71.4	55.5	25.0	93.5	96.9	66.0	26.6
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Antibiotic B	3.5	0	0	66.1	63.6	0	2.2
Penicillin	3.5	0	0	27.4	39.3	0	0
Antibiotic C	14.2	7.4	18.7	46.7	72.6	22.0	11.1

ADAPTED FROM PERRY[2]

Furadantin's "high degree of effectiveness against bacteria responsible for urinary tract infections is brought out by this study."[2]

Furadantin dosage—simple and safe: Average adult dose is 100 mg., q.i.d., (at mealtime, and on retiring, with food or milk). Average daily dosage for children is 5 to 7 mg./Kg. in four divided doses.

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Oral Suspension, 5 mg. per cc., bottle of 118 cc.

REFERENCES: 1. Walsbren, B. A., and Crowley, W.: A.M.A. Arch. Int. M. 95:653, 1955. 2. Perry, R. E., Jr.: North Carolina M. J. 16:567, 1955.

NITROFURANS—A NEW CLASS OF ANTIMICROBIALS—NEITHER ANTIBIOTICS NOR SULFAS

Eaton LABORATORIES

Upjohn

Delta-Cortef* for inflammation, neomycin for infection:

Neo-Delta-Cortef†

TOPICAL OINTMENT

Each gram contains:

Delta-1-hydrocortisone acetate 5 mg. (0.5%)

Neomycin sulfate.....5 mg.
(equiv. to 3.5 mg. neomycin base)

Methylparaben.....0.2 mg.

Butyl-p-hydroxybenzoate 1.8 mg.

Supplied: 5-gram tubes

EYE-EAR OINTMENT

Each gram contains:

Delta-1-hydrocortisone acetate 2.5 mg. (0.25%)

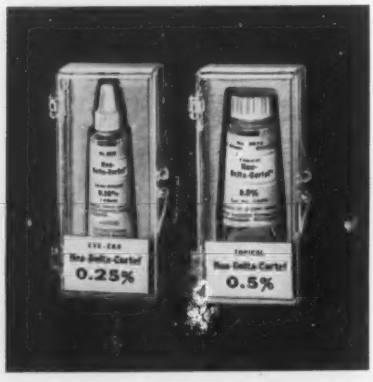
Neomycin sulfate.....5 mg.
(equiv. to 3.5 mg. neomycin base)

Supplied: ⅛ oz. tubes with applicator tip

*TRADEMARK

†TRADEMARK FOR THE UPJOHN BRAND OF PREDNISOLONE ACETATE WITH NEOMYCIN SULFATE

The Upjohn Company, Kalamazoo, Michigan



new

Azo Gantrisin

Especially for Urinary Tract Infections

Azo Gantrisin provides -- in a single tablet -- the wide antibacterial spectrum of Gantrisin plus the local pain-relieving action of a widely accepted urinary tract analgesic.

Advantages of Azo Gantrisin: Effective antibacterial concentrations in blood as well as urine; prompt relief of local discomfort; rapid appearance of orange-red dye in urine also has favorable psychologic effect.

Each tablet contains 0.5 Gm Gantrisin 'Roche' plus 50 mg phenylazo-diamino-pyridine HCl.

Hoffmann - La Roche Inc
Nutley • N.J.

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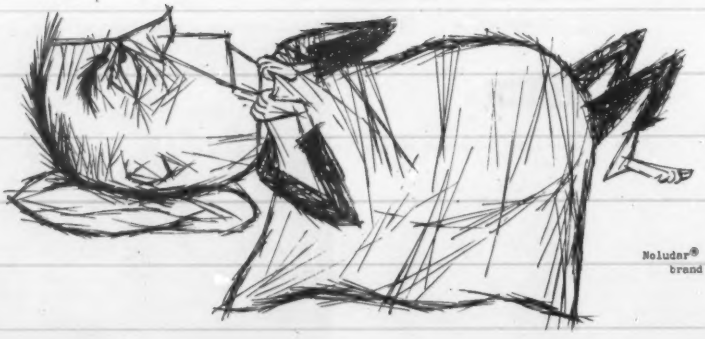
Gantrisin® - brand of sulfisoxazole

For patients who take their troubles to bed —

Noludar 'Roche' brings welcome rest. Not a barbiturate, not habit forming, 200 mg induces a sound night's sleep without hangover, or 50 mg t.i.d. provides daytime sedation without somnolence. Noludar tablets, 50 and 200 mg; elixir, 50 mg per teaspoon.

Hoffmann - La Roche Inc.
Nutley 10, New Jersey



Noludar®
brand of methyprylon

antihistaminic benefits of Benadryl
neutralizing action of zirconium

ZIRADRYL® LOTION

Benadryl® Hydrochloride with Zirconium

an old favorite in a new form

ZIRADRYL Lotion provides the same recognized clinical advantages as ZIRADRYL Cream. Antihistaminic-antipruritic properties of Benadryl are combined with the urushiol-neutralizing action of zirconium for effective prevention or treatment of ivy or oak poisoning.

protects against rhus dermatitis

if applied before or soon after exposure.

relieves rhus dermatitis

and reduces spreading if applied after dermatitis appears.

ZIRADRYL Lotion is supplied in 6-ounce bottles.
ZIRADRYL Cream is supplied in 1-ounce tubes.

PARKE, DAVIS & COMPANY DETROIT, MICHIGAN

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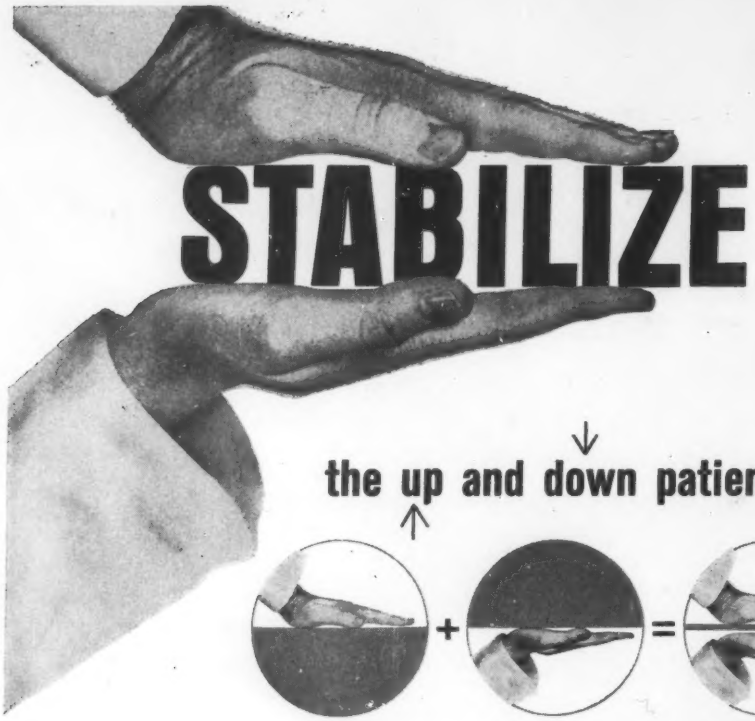

To induce emotional equilibrium in those who swing from anxiety to depression, Serpatilin combines the relaxing, tranquilizing action of Serpasil with the mild mood-lifting effect of the new cortical stimulant, Ritalin. In recent months, numerous clinical studies have indicated the value of combining these agents for the treatment of various disorders marked by tension, nervousness, anxiety, apathy, irritability and depression. Arnoff,[1] in a study of 51 patients, found the combination of definite value in a variety of complaints, noting no effect on blood pressure or heart rate. Lazarte and Petersen[2] also found Serpatilin effective in counteracting the side effects of reserpine and chlorpromazine. They reported: "The stimulating effect of Ritalin seemed complementary to the action of reserpine . . . in that it brought forth a better quality of increased psychomotor activity."

1. Arnoff, B.: Personal communication. 2. Lazarte, J. A., and Petersen, M.C.: Personal communication.

Serpatilin Tablets, 0.1 mg./10 mg., each containing 0.1 mg. Serpasil® (reserpine CIBA) and 10 mg. Ritalin® hydrochloride (methyl-phenidylacetate hydrochloride CIBA).

Dosage: 1 tablet b.i.d. or t.i.d., adjusted to the individual.

CIBA
SUMMIT, N. J.

Serpatilin T.M.

(reserpine and methyl-phenidylacetate hydrochloride CIBA)

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